Attachment B

(request dated 28, 2000)

DRAFT

SURFACE SOIL ASSESSMENT
Hecla Mining Company - Apex Unit
St. George, Utah

June 7, 1995

Prepared For:

DRAFT

Hecla Mining Company
6500 Mineral Drive
Coeur d'Alene, Idaho 83814 - 8788

Kleinfelder File No. 31-6930-04

Surface Soil Assessment
Hecla Mining Company - Apex Unit
St. George, Utah

Prepared by:

James Anderson, P.G.
Project Geologist

Daniel Horns, Ph.D., P.G.
Staff Geologist

KLEINFELDER, INC.
2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109

June 7, 1995

(d:\JA\6930-04)

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1.0 EXECUTIVE SUMMARY

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In May 1995, Kleinfelder was retained by Hecla Mining Company to assess potential impacts to soils at the Apex Unit Processing Plant. Eighty surface soil samples were collected from eight discreet areas within the facility (the plant area, surge pond, Pond 1C, Pond 2A, Pond 3B, a soil stockpile, and two ore storage areas). Two samples were also collected from around the facility area to assess potential impact by wind-born dust. For comparison, seven background soil samples were collected from four areas that appear to represent conditions on the facility. Samples were analyzed for 12 metals (arsenic, barium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, silver, zinc). In addition, selected samples from the process plant area were analyzed for total recoverable petroleum hydrocarbons, and some samples from the plant area and one of the ore storage areas were analyzed for gross alpha and beta radiation.

2.0 INTRODUCTION

2.1 General

Kleinfelder Inc., was retained by Hecla Mining Company to provide environmental engineering services to assess the potential that metals may have impacted soils at the Apex Plant facility.

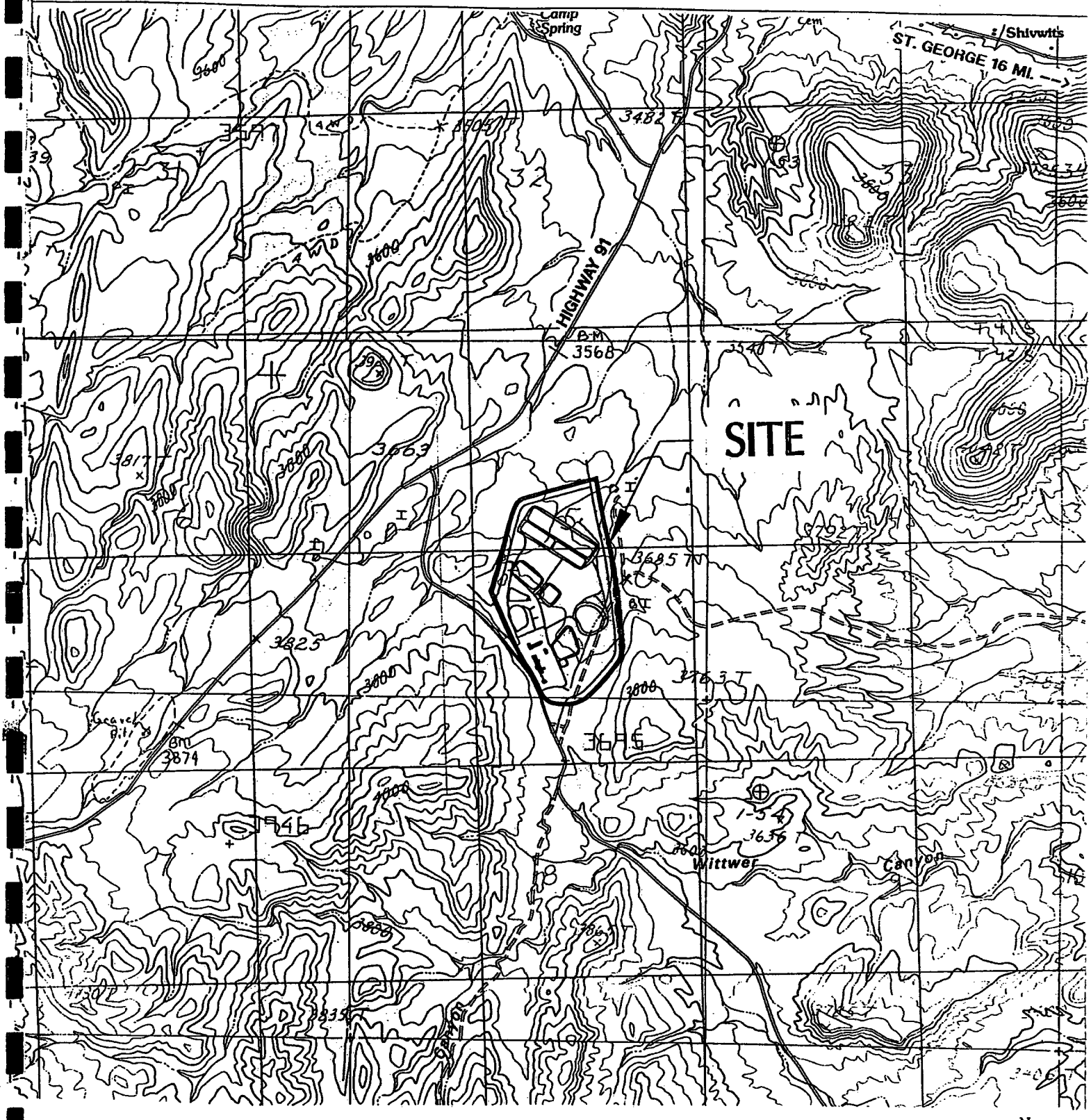
Hecla Mining Company's Apex Plant is located approximately 16 miles west of St. George, Utah (Plate 1). The plant is approximately 160 acres in size and has operated for the past 10 years processing Germanium (Ge) and Gallium (Ga) from ores mined at the Apex mine. In 1992, the plant began processing primarily cobalt. Currently, cobalt is extracted from spent petroleum catalysts rather than from ore.

2.2 Scope of Work

The scope of services, as described in the Sampling and Analysis Plan (see Appendix A), includes collecting soil samples from the following areas (Plate 2):

- Ore Storage Areas 1 and 2
- Plant/ Process Area
- Pond 2A
- Pond 1C
- Pond 3B North and South
- Surge Pond
- Soil Stockpile
- Windblown (Two sites in the plant vicinity)
- Background (several sites in the plant vicinity)

All samples collected during the assessment were analyzed for metals: Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Silver and Zinc. Eleven samples (many composited) were analyzed for total petroleum hydrocarbons (TPH). Additionally four composite samples were analyzed for gross α/β radiation (EPA method 9030).



REFERENCE:
SHIVWITS, UTAH
U.S.G.S. 7.5 MINUTE QUADRANGLE
1983

0 500' 1000' 2000'

SCALE 1 : 24000
1" = 2000'
CONTOUR INTERVAL 40 FEET

UTAH
MAP LOCATION

N

KLEINFELDER

Project Number 31- 6930-60

Hecla Mining Company, Apex Unit
St. George, Utah

SITE LOCATION MAP

PLATE
1

2.3 Geologic Setting

2.3.1 Topographic Setting

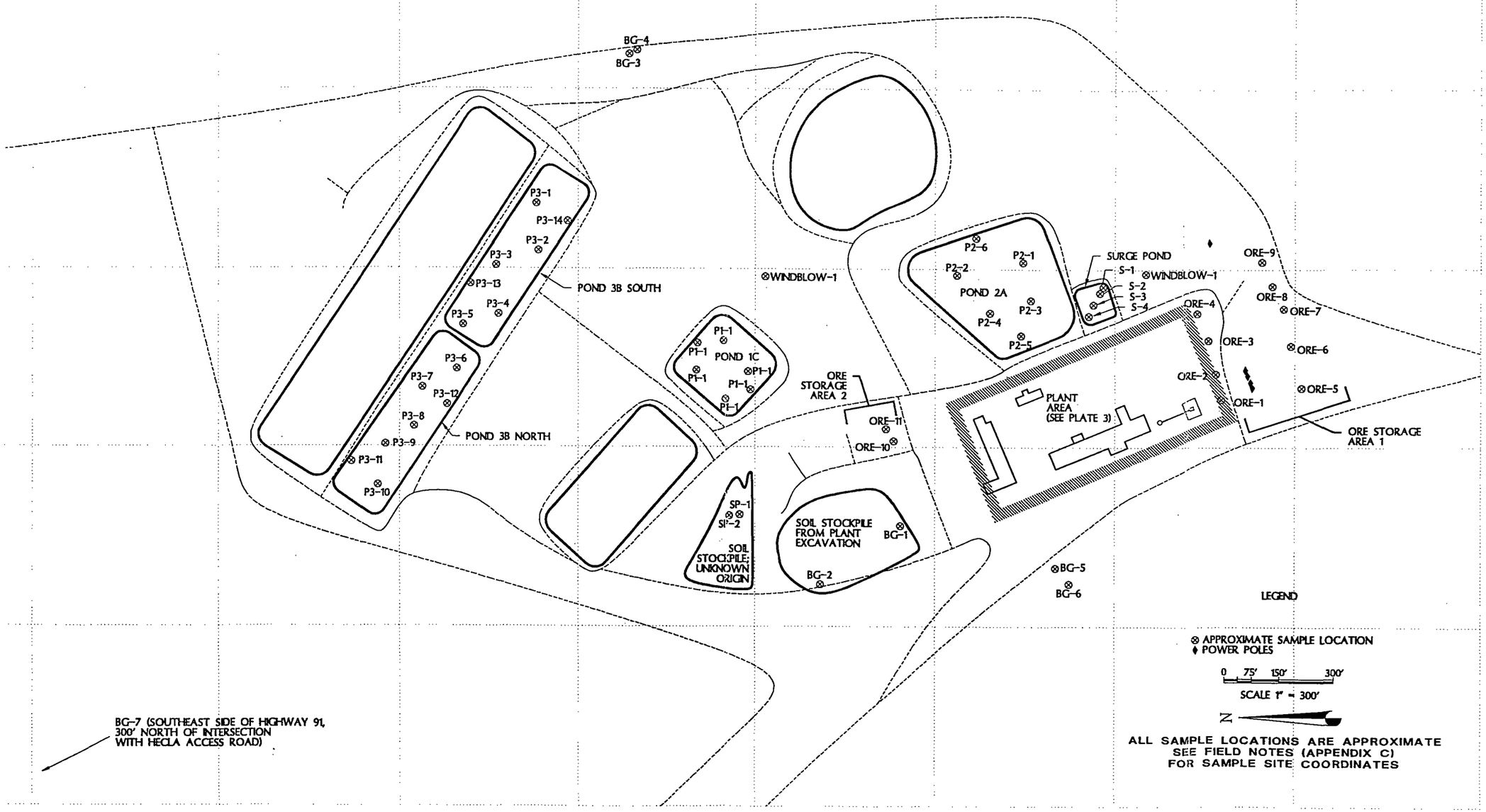
The Hecla Mining Company, Apex Unit Processing Plant is located at an elevation of approximately 3,700 feet on the northeast slope of the Beaver Dam Mountains (Plate 1). The plant lies near the base of a broad, north-trending, gently northward-sloping valley. The valley is bound on the east and west by low, rolling, north-trending ridges. The Shivwits, Utah 7.5" Topographic Quadrangle shows an ephemeral stream along the east side of the Plant area. The stream drains to the north, and does not extend southward beyond the Plant area.

2.3.2 Bedrock Geology

Bedrock in the vicinity of the Apex Plant is composed of rock of the Moenkopi Formation (Hintze, 1986). The Moenkopi Formation consists of interbedded limestone, dolomitic limestone, dolomite, siltstone, dolomitic siltstone, mudstone, gypsum, sandstone, and conglomerate deposited during Triassic time. In the vicinity of the Apex Plant, rock of the Moenkopi Formation consists dominantly of sandstone, siltstone, mudstone, dolomitic limestone, dolomite, and gypsum. These rocks are exposed on the ridges to the west and east of the plant.

2.3.3 Quaternary Sediments

The base of the broad valley at the Apex Plant is filled by Quaternary colluvial, alluvial, and fluvial deposits. These Quaternary deposits, derived generally from rock of the Moenkopi Formation exposed on the ridges on either side of the valley, are composed of interbedded gravel, sand, silt, and clay. Dominant sediment types noted during sampling are gravelly clays and clayey gravels. Given the lithology of the nearby Moenkopi Formation, the Quaternary sediments may be relatively rich in carbonate and sulfate salts.



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PROJECT NO. 31-6930-60

Hecla Mining Company, Apex Unit
St. George, Utah

SITE PLAN

PLATE 2

2.3.4 Geologic Structures

The valley at the Apex Plant is bound on the east and west by north-striking normal faults (Hintze, 1986). These faults do not appear to have affected Quaternary deposits in the area (Hintz, 1986), and Hecker (1993) does not show these faults as having Quaternary activity.

3.0 FIELD ACTIVITIES

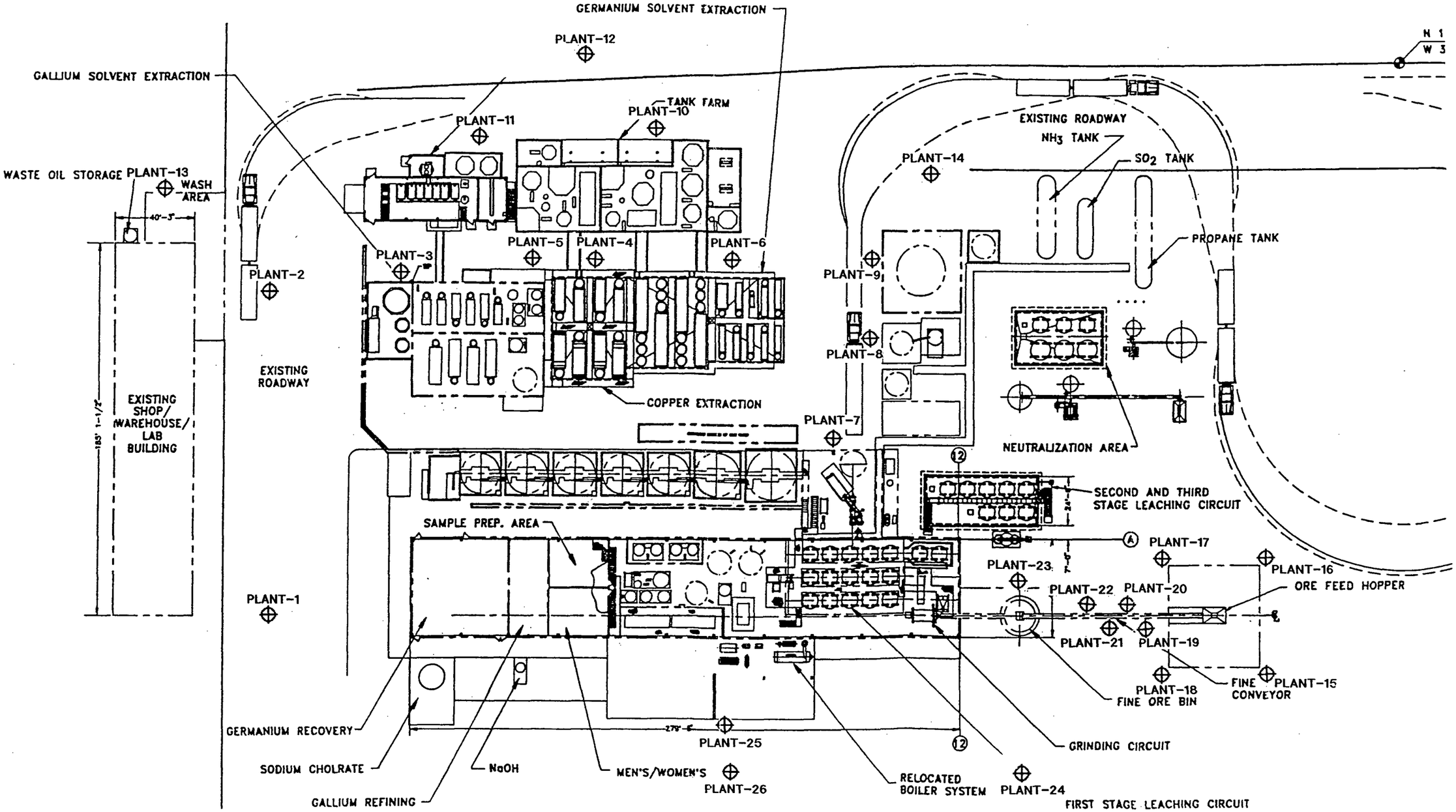
The Sampling and Analysis Plan (Appendix A) describes general sampling locations and depths, and specifies chemical analyses to be performed. The sampling and decontamination protocol were developed through discussions between Kleinfelder and Mr. Gary Gamble of Hecla Mining Company. Sampling locations were refined in the field based on site-specific information provided by Mr. Anh Mai and Ms. Penny Bassett of Hecla Mining Company.

3.1 Sample Locations

Surface soils (0 to 1 foot depth) were sampled in the following locations to assess potential impacts:

- Process Plant Area: 29 samples from 26 sites (Plant-1 through Plant 26, Plate 3)
- Ore Storage Area #1: 10 samples from 9 sites (Ore-1 through Ore-9, Plate 2)
- Ore Storage Area #2: 2 samples from 2 sites (Ore-10 and Ore-11, Plate 2)
- Pond 3B, North and South: 16 samples from 14 sites (P3-1 through P3-14, Plate 2)
- Pond 2A: 7 samples from 6 sites (P2-1 through P2-6, Plate 2)
- Pond 1C: 7 samples from 6 sites (P1-1 through P1-6, Plate 2)
- Stockpile Area: 2 samples from 2 sites (SP-1 and SP-2, Plate 2)
- Windblown Area: 3 samples from 2 sites in the plant vicinity (Windblow-1 and Winblow-2, Plate 2)
- Surge Pond: 4 samples from 4 sites (S-1 through S-4, Plate 2)
- Background Areas Unaffected by Plant Activities: 7 samples from 7 sites (BG-1 though BG-7, Plate 2)

Generally, samples were collected at the locations specified by Kleinfelder's Sampling and Analysis Plan. Background samples were collected from four general areas: (1) the soil stockpile generated during plant excavation/construction (samples BG-1 and BG-2); (2) soils near the east border of the Apex facility (BG-3 and BG-4); (3) soils west of the Apex facility (BG-5 and BG-6); and (4) soils approximately 0.7 miles northwest of the Apex facility (BG-7). The rational for selecting these four areas is as follows. Background samples were collected from the stockpile to characterize soils


GERMANIUM SOLVENT EXTRACTION
PLANT-12
GALLIUM SOLVENT EXTRACTION
TANK FARM
PLANT-10
PLANT-11
EXISTING ROADWAY
NH3 TANK
SO2 TANK
WASTE OIL STORAGE
PLANT-13
WASH AREA
PLANT-14
PROPANE TANK
PLANT-3
PLANT-5
PLANT-4
PLANT-6
PLANT-2
PLANT-9
EXISTING ROADWAY
PLANT-8
COPPER EXTRACTION
PLANT-7
EXISTING SHOP/ WAREHOUSE/ LAB BUILDING
NEUTRALIZATION AREA
SECOND AND THIRD STAGE LEACHING CIRCUIT
SAMPLE PREP. AREA
PLANT-17
PLANT-23
PLANT-16
ORE FEED HOPPER
PLANT-22
PLANT-20
PLANT-1
PLANT-21
PLANT-19
PLANT-18
FINE ORE BIN
FINE CONVEYOR
PLANT-15
GERMANIUM RECOVERY
PLANT-25
GRINDING CIRCUIT
SODIUM CHOLRATE
NaOH
MEN'S/WOMEN'S
PLANT-26
RELOCATED BOILER SYSTEM
PLANT-24
GALLIUM REFINING
FIRST STAGE LEACHING CIRCUIT
PLANT-1: Soil sampling site
0
50'
Scale 1 inch = 50 feet
KLEINFELDER
PROJECT NO.
Soil Sample Sites in the Plant Area
PLATE 3

M-7

collected from both east and west of the facility to incorporate the range in soil types across the facility. A background sample was collected from 0.7 miles northwest of the facility to compare with those samples from closer to plant operations.

3.2 Soil Sample Collection

Each sample was issued a unique sample I.D. number and logged on sample control logs for sample description and documentation purposes (Appendix B). Labels on each sample included the sample I.D. number, the date and time of collection, the job number, and the sample preservation method used (if any).

The samples were labeled, stored, transported and remitted to an independent EPA-certified analytical laboratory, American West Analytical Laboratories, in Salt Lake City, Utah, according to standard chain-of-custody protocol.

Soil samples were collected after vegetation and the top 1 to 2 inches of loose soil were scraped away. Background samples were collected from 10 to 16 inches below ground level in order to reduce possible effects of windblow dust. The observed soils at 10 to 16 inches depth did not vary in general composition from surface soils in the facility and are considered representative of the uppermost soils.

Six-inch stainless steel sample tubes were pushed into the soil after the top two inches had been removed. The ends of the sampler tubes were covered with Teflon™ sheets and capped with durable plastic end-caps. In areas where the surface soil was too dense to push the stainless steel sampling tube, the soil was loosened by using a chisel. The chisel was driven into the soil in the vicinity to loosen a small volume of soil. Loosened soil from the area, but not adjacent to the chisel, was then placed by hand into a stainless steel tube.

A fresh pair of disposable latex gloves was worn when each sample was collected. After sealing, sample tubes were labeled, recorded on a log, placed in sealed bags, and transported as described below (Section 3.4).

3.3 Decontamination Protocol

To reduce the potential for introducing contamination into the samples, the stainless steel sample tubes were pre-cleaned using a detergent wash followed by a steam rinse. Sample equipment, including chisels, hammers and hand tools was decontaminated before collecting each sample by scrubbing with a non-phosphate detergent and water solution followed by a rinse with de-ionized water. Approximately 4 gallons of liquid was generated by this procedure. Liquid generated by on-site decontamination was disposed of as directed by Hecla at the plant's landfill area.

3.4 Sample Handling

Upon collection, each sample was issued a unique sample I.D. Labels on each sample included the sample I.D. number, the date and time of collection, the job number, and the sample preservation method used (if any).

After securing and labeling each sample, sample information was recorded on the chain-of-custody and on a Sample Control Log. The sample control logs are in Appendix B. Each sample was then immediately stored in an iced cooler for transport to the analytical laboratory. The chain-of-custody form accompanied the cooler at all times. The chain-of-custody form included Kleinfelder's name, address and telephone number, the date and time the samples were collected, the number of containers each sample occupied, and the analyses for which the samples were being submitted. The chain-of-custody form was signed by each person who handled the samples. A copy of the chain-of-custody form is presented in Appendix D.

3.5 Sample Analysis

All surface samples collected were analyzed for the following nine metals by ICP (EPA Method 6010): barium, cadmium, chromium, cobalt, copper, lead, nickel, silver and zinc. Additionally, arsenic was analyzed by Method 7060, mercury by Method 7471, and selenium by Method 7740.

Eleven samples were also analyzed for total recoverable petroleum hydrocarbons (TRPH) by Method 418.1. Six of these samples were composites of two to four samples collected in the field. The laboratory performed all composting.

Four composite samples were analyzed for gross alpha/beta radiation by EPA Method 9030. The composite samples are each composed of two to four samples collected from selected areas in the process plant and in Ore Storage Area 1. The laboratory performed all composting..

4.0 RESULTS

4.1 Background Soil Concentrations

Background soil metals concentrations were measured at seven locations: BG-1 through BG-7. These seven locations are shown on Plate 2.

The analytical results are summarized on Table 1. Of the 12 metals measured, two (mercury and selenium) were not detected at concentrations exceeding the reporting limit of 0.1 mg/kg in the background samples. Background ranges for each of the remaining 10 metals were estimated by calculating the average concentration, plus or minus three standard deviations, for each metal. This results in the following ranges.

Analyte	Background Range (Sample Mean $\pm$ 3 Std. Dev.)		
Arsenic	0	-	7.2
Barium	49	-	152
Cadmium	0.1	-	0.7
Chromium	2	-	20
Cobalt	2.4	-	9.6
Copper	7	-	20
Lead	0.9	-	12.9
Mercury	<0.1		
Nickel	2.2	-	17.8
Selenium	<0.1		
Silver	0	-	2.3
Zinc	2	-	57

Based on observed soil composition, the ranges developed above should be generally representative of natural shallow soil conditions in the facility. Metals concentrations

TABLE 1
SURFACE SOIL SAMPLES by AREA
Laboratory Analytical Results for Total Metals
Hecla Mining Company, Apex Plant
St. George, Utah
reported in mg/kg

BACKGROUND													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-42	BG1	1.1	120	0.3	14	6.8	14	4.6	12	<0.1	<0.1	<0.5	39
22631-43	BG2	2.5	66	0.3	6	3.7	16	5.3	5.4	<0.1	<0.1	0.9	13
22631-49	BG3	2.0	110	0.4	12	6.5	12	6.6	11	<0.1	<0.1	<0.5	31
22631-50	BG4	2.4	100	0.5	11	6.0	10	6.9	10	<0.1	<0.1	<0.5	25
22631-85	BG5	5.2	100	0.3	11	5.6	11	9.7	9.8	<0.1	<0.1	1.3	25
22631-86	BG6	4.3	110	0.3	11	5.8	12	9.4	10	<0.1	<0.1	1.1	29
22631-87	BG7	1.7	97	0.5	13	7.7	16	5.5	14	<0.1	<0.1	<0.5	41
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	NA	NA	**2.3**	**57**
Average		2.7	100	0.4	11	6.0	13	6.9	10	NA	NA	0.5	29
Standard Dev.		1.5	17	0.1	3	1.2	2	2.0	2.6	NA	NA	0.6	9

POND 3B NORTH & SOUTH													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-44	P3-1	8	89	0.8	13	22	11	6.1	23	<0.1	<0.1	<0.5	910
22631-45*	P3-2*	140	33	10	190	69	40	9.5	86	<0.1	<0.1	0.5	6400
22631-46*	P3-2*	65	23	7.5	160	53	26	9.1	64	<0.1	<0.1	<0.5	4200
22631-48	P3-3	62	110	2.3	31	53	25	9.3	48	<0.1	<0.1	<0.5	1900
22631-58	P3-4	4.8	99	2.1	13	20	10	6.2	23	<0.1	<0.1	<0.5	640
22631-59	P3-5	8.4	93	0.8	14	21	9.3	5.5	25	<0.1	<0.1	<0.5	570
22631-61	P3-6	79	67	2.1	24	36	9.5	8	37	<0.1	<0.1	<0.5	1300
22631-62	P3-7	49	67	2.3	19	67	15	8.7	52	<0.1	<0.1	<0.5	2200
22631-68	P3-8	2.7	94	0.7	10	5.3	6.8	5.5	10	<0.1	<0.1	<0.5	25
22631-66*	P3-9*	3.6	67	0.8	4.5	3.5	2.2	6.6	5.5	<0.1	<0.1	<0.5	59
22631-67*	P3-9*	7.2	75	1.0	6.1	6.1	4.2	9.7	8.1	<0.1	<0.1	<0.5	150
22631-65	P3-10	3.8	44	3.4	5.2	22	2.8	9.3	16	<0.1	<0.1	<0.5	1400
22631-64	P3-11	7.1	84	0.9	10	14	8.7	6.7	24	<0.1	<0.1	<0.5	140
22631-63	P3-12	2.6	74	0.7	5.3	3	3.1	5.6	5.4	<0.1	<0.1	<0.5	15
22631-60	P3-13	2500	60	14	380	37	87	20	54	<0.1	0.1	<0.5	2500
22631-47	P3-14	3.2	81	2.3	8.3	58	18	9.9	49	<0.1	<0.1	<0.5	4400
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	NA	NA	**2.3**	**57**
Average		39.1	74.3	2.8	44.1	32.4	14.5	7.7	34.7	0.0	0.0	0.0	1668.5
Standard Dev.		44.4	27.1	3.1	65.5	24.6	11.4	1.7	25.5	0.0	0.0	0.2	1992.6

* Duplicate samples

Background Range is defined as the background mean plus three standard deviations

Table 1, continued

PLANT													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-01	Plant 1	92	66	7.2	9.1	260	260	170	28	<0.1	<0.1	0.7	250
22631-02	Plant 2	230	150	14	11	120	570	240	55	<0.1	<0.1	15	530
22631-03*	Plant 3*	2.6	76	0.2	7.8	4.4	7.1	7.2	7.1	<0.1	<0.1	1.5	18
22631-04*	Plant 3*	2.7	86	0.3	8.4	5.7	7.5	8.2	7.6	<0.1	<0.1	1.7	19
22631-05	Plant 4	190	140	42	6.6	80	600	380	32	<0.1	<0.1	3.1	590
22631-06	Plant 5	100	210	9.5	11	59	340	280	22	<0.1	<0.1	2.7	660
22631-07	Plant 6	2.2	63	0.2	8.6	4.2	16	5	7.1	<0.1	<0.1	1.1	22
22631-08	Plant 7	410	85	6	9.6	46	630	480	18	0.2	<0.1	3.3	430
22631-09	Plant 8	40	150	1.1	8.7	14	70	81	11	<0.1	<0.1	0.7	76
22631-10	Plant 9	21	78	1.1	5.3	5.4	53	50	7.4	<0.1	<0.1	<0.5	49
22631-11	Plant 10	200	73	75	8.2	72	430	410	21	<0.1	<0.1	5.1	680
22631-12	Plant 11	240	90	8.8	12	57	450	400	21	<0.1	<0.1	3.3	580
22631-13	Plant 12	510	120	7.7	10	20	4300	980	22	0.1	2	4.5	1000
22631-14*	Plant 13*	1200	310	35	16	280	4400	2500	110	0.4	1.5	9.5	4900
22631-15*	Plant 13*	930	250	30	15	250	2700	2300	88	0.4	2	10	4400
22631-16	Plant 14	2.6	79	0.3	7.3	4.1	11	9.1	6.6	<0.1	<0.1	1.6	18
22631-17	Plant 15	8.8	35	1.5	6.7	40	7.9	23	10	<0.1	<0.1	0.7	15
22631-18	Plant 16	10	29	1.4	5.9	91	23	26	9	<0.1	<0.1	<0.5	26
22631-19	Plant 17	3600	270	46	41	1500	8700	8900	150	1.6	3.2	33	9100
22631-20	Plant 18	5000	620	640	21	420	28000	13000	260	2.3	5.3	36	16000
22631-21	Plant 19	71	91	3.6	11	300	91	160	17	<0.1	<0.1	0.8	120
22631-22	Plant 20	7000	300	110	30	690	12000	20000	220	0.6	6.4	40	11000
22631-23	Plant 21	80	89	4	11	100	87	110	20	<0.1	<0.1	1.2	97
22631-24	Plant 22	2700	230	43	15	180	8600	9900	100	0.2	2.8	25	8900
22631-25*	Plant 23*	36	66	1.3	9.8	100	74	89	16	<0.1	<0.1	0.7	82
22631-26*	Plant 23*	10	68	0.6	10	85	40	33	13	<0.1	<0.1	1	63
22631-27	Plant 24	180	94	17	17	290	150	250	36	<0.1	<0.1	1.8	200
22631-28	Plant 25	58	22	1.6	9.3	87	160	47	14	<0.1	<0.1	0.8	160
22631-29	Plant 26	200	110	19	21	900	430	370	79	<0.1	0.2	4.7	410
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	**NA**	**NA**	**2.3**	57
Average		797.48	139.66	38.88	12.53	209.13	2524.40	2110.64	48.54	0.20	0.81	7.22	2082.59
Standard Dev.		1677.96	122.39	118.40	7.67	324.00	5793.78	4745.89	64.48	0.52	1.67	11.40	4053.23

* Duplicate samples

Background Range is defined as the background mean plus two standard deviations

Table 1, continued

ORE STORAGE #1													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-30	Ore 1	110	44	7.8	25	1100	160	170	110	<0.1	0.3	3.9	300
22631-31	Ore 2	1400	210	15	13	190	2200	2500	69	<0.1	1.9	8.8	2000
22631-32	Ore 3	3500	550	80	21	220	9700	10000	170	0.2	1.5	28	16000
22631-33	Ore 4	2500	390	47	15	210	8200	6400	110	0.2	7	21	7200
22631-34	Ore 5	3.2	32	1	7.5	3.5	5	12	7.1	<0.1	0.1	<0.5	11
22631-35*	Ore 6*	2.5	30	1.1	6.4	3.2	3.4	9.6	7.1	<0.1	<0.1	<0.5	9
22631-36*	Ore 6*	3.2	33	1	6.9	3.3	4.6	9.4	7.3	<0.1	<.01	<0.5	12
22631-37	Ore 7	61	140	1.5	16	12	130	120	18	<0.1	0.2	<0.5	270
22631-38	Ore 8	24	100	0.2	13	8	47	62	12	<0.1	0.1	<0.5	60
22631-39	Ore 9	28	110	0.5	13	7.7	58	48	12	<0.1	<0.1	<0.5	100
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	NA	NA	**2.3**	**57**
Average		763.19	163.90	15.51	13.68	175.77	2050.80	1933.10	52.25	0.04	1.11	6.17	2596.20
Standard Dev.		1275.96	175.35	26.86	6.03	338.29	3714.24	3494.30	59.00	0.08	2.18	10.20	5213.38

ORE STORAGE #2													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-40	Ore 10	0.6	140	0.3	14	7.1	15	7.1	13	<0.1	<0.1	<0.5	40
22631-41	Ore 11	<0.5	150	0.4	16	8	26	20	14	<0.1	<0.1	<0.5	54
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	NA	NA	**2.3**	**57**
Average		0.30	145.00	0.35	15.00	7.55	20.50	13.55	13.50	0.00	0.00	0.00	47.00
Standard Dev.		0.42	7.07	0.07	1.41	0.64	7.78	9.12	0.71	0.00	0.00	0.00	9.90

POND 1C													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-69	P1-1	890	40	50	5.9	6.4	640	20	11	<0.1	<0.1	<0.5	6300
22631-70	P1-2	91	28	5.6	5.7	3.5	83	9.2	6.6	<0.1	<0.1	<0.5	250
22631-72	P1-3	4.3	17	0.9	4.5	2.5	1.7	7.4	5.6	<0.1	<0.1	<0.5	4.7
22631-73	P1-4	21	80	1	11	5.1	17	6.9	8.8	<0.1	0.3	<0.5	54
22631-74*	P1-5*	17	19	1.2	4.5	3.5	10	11	5.5	<0.1	<0.1	<0.5	11
22631-75*	P1-5*	33	24	1.5	5.2	3.4	19	12	5.3	<0.1	<0.1	<0.5	22
22631-71	P1-6	5.3	89	0.9	11	4.1	7.9	9.1	7.7	<0.1	<0.1	1	26
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	NA	NA	**2.3**	**57**
Average		151.66	42.43	8.73	6.83	4.07	111.23	10.80	7.21	0.00	0.04	0.14	952.53
Standard Dev.		326.92	29.80	18.28	2.90	1.29	234.77	4.44	2.11	0.00	0.11	0.38	2359.57

* Duplicate samples

Background Range is defined as the background mean plus two standard deviations

Table 1, continued

POND 2A													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-51	P2-1	5	93	0.3	11	7.5	14	17	11	<0.1	<0.1	<0.5	42
22631-53	P2-2	3.1	85	1	5.8	3.7	15	9.7	7.6	<0.1	<0.1	<0.5	9
22631-54*	P2-3*	15	67	<0.2	7.2	4.7	48	34	6.9	<0.1	<0.1	<0.5	26
22631-55*	P2-3*	3.2	63	<0.2	6.1	3.1	41	<3.0	4.9	<0.1	<0.1	<0.5	16
22631-57	P2-4	0.8	260	<0.2	3.7	1.5	18	<3.0	2.6	<0.1	<0.1	<0.5	6.9
22631-56	P2-5	5	160	<0.2	8.2	8	22	19	8.9	<0.1	<0.1	<0.5	22
22631-52	P2-6	1.6	180	0.3	8.8	5.3	16	3.4	8.9	<0.1	<0.1	<0.5	23
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	**NA**	**NA**	**2.3**	**57**
Average		4.21	113.50	0.20	6.35	4.23	21.75	10.39	6.35	0.00	0.00	0.00	18.11
Standard Dev.		4.72	81.83	0.35	3.37	2.76	15.52	12.24	3.64	0.00	0.00	0.00	13.16

STOCKPILE													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-76	SP-1	3.2	52	1	5.8	3.2	3	8	6.8	<0.1	<0.1	<0.5	12
22631-77	SP-2	3	32	1.1	5.6	3	2.7	8.9	7	<0.1	0.3	<0.5	6.3
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	**NA**	**NA**	**2.3**	**57**
Average		3.10	42.00	1.05	5.70	3.10	2.85	8.45	6.90	0.00	0.15	0.00	9.15
Standard Dev.		0.14	14.14	0.07	0.14	0.14	0.21	0.64	0.14	0.00	0.21	0.00	4.03

WINDBLOWN													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-78	Wind Blow 1	22	100	0.5	12	6.5	19	25	9.1	<0.1	<0.1	<0.5	40
22631-83*	Wind Blow 2*	24	110	0.5	9.2	10	44	45	9.9	<0.1	<0.1	<0.5	77
22631-84*	Wind Blow 2*	27	110	0.6	11	11	43	53	11	<0.1	0.1	<0.5	68
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	**NA**	**NA**	**2.3**	**57**
Average		24.33	106.67	0.53	10.73	9.17	35.33	41.00	10.00	0.00	0.03	0.00	61.67
Standard Dev.		2.52	5.77	0.06	1.42	2.36	14.15	14.42	0.95	0.00	0.06	0.00	19.30

SURGE POND													
Lab ID	Sample Location	As	Ba	Cd	Cr	Co	Cu	Pb	Ni	Hg	Se	Ag	Zn
22631-79	S-1	3.6	25	1.1	5.8	3.2	3.4	11	6.7	<0.1	<0.1	<0.5	8.1
22631-80	S-2	44	36	1.5	5.9	4.1	37	53	7.3	<0.1	0.1	<0.5	53
22631-81	S-3	660	39	7.5	7.8	11	180	84	12	<0.1	0.2	<0.5	690
22631-82	S-4	1.9	67	0.2	5.4	3.4	6.2	<3.0	5.8	<0.1	<0.1	<0.5	15
Background Range (upper end)		**7.2**	**152**	**0.7**	**19**	**9.7**	**20**	**12.9**	**18**	**NA**	**NA**	**2.3**	**57**
Average		177.38	41.75	2.58	6.23	5.43	56.65	37.00	7.95	0.00	0.08	0.00	191.53
Standard Dev.		322.34	17.88	3.33	1.07	3.74	83.63	38.77	2.77	0.00	0.10	0.00	332.90

* Duplicate samples

Background Range is defined as the background mean plus two standard deviations

in the sample from BG-7 (0.7 mile from the facility) are similar to concentrations in samples collected closer to the facility
Table 1.

4.2 Metals Analysis

Of the 12 metals analyzed, all were detected at concentrations exceeding laboratory reporting limits in at least some areas of the facility, though mercury and selenium were not detected at most sites. The highest detected concentrations were generally found in the process plant area, especially around the ore feed hopper and conveyor. High concentrations were also reported in samples from the north side of the primary ore storage area (Ore Storage Area 1). Metals results are summarized in Table 1. The laboratory reports are in Appendix D.

4.3 Total Recoverable Petroleum Hydrocarbons

Eleven samples from the process plant area were analyzed for TRPH concentrations. Six of these samples are composites of two to four discrete sample locations. Composites were analyzed when several samples were collected within one area where operations appeared to be consistent around the area. For instance, two samples collected from the machine wash area were composited, and two samples from the solvent tank area were composited.

The highest TRPH concentrations were found in the machine wash area (580 ppm), the parking area (360 ppm), and the solvent tank area (110 ppm). The remaining samples contained concentrations between 9 and 54 ppm. The results are summarized on Table 2. The original laboratory report is in Appendix D.

4.4 Gross Alpha/Beta Radiation

Four composite samples were analyzed for gross alpha and beta radiation. Two of the composite samples are from the plant area and two are from Ore Storage Area 1. The four samples contain relatively low levels of radiation, with gross alpha radiation reported up to 10 +/- 6 pCi/g and gross beta radiation reported up to 18 +/- 6 pCi/g. Results are summarized in Table 3. The original laboratory report is in Appendix D.

TABLE 2
SURFACE SOIL SAMPLES – TRPH (mg/kg - ppm)
Hecla Mining Company, Apex Plant
St. George, Utah

Lab ID	Sample Location	TRPH Concentration	Comments	Surface soils cleared*
L22631-1	Plant 1	360	Parking area	no
L22631-13	Plant 12	25	Gravel road, east of plant	no
L22631-25	Plant 23	9	Gravel road, south of plant	no
L22631-28	Plant 25	54	Gravel road, west of plant	no
L22631-88	Plant 2 & 13 Composite	580	Machine wash area	no
L22631-89	Plant 3	<5	Solvent tank area	yes
L22631-90	Plant 4 & 5 Composite	110	Solvent tank area	no
L22631-91	Plant 7, 8 & 9 Composite	20	Gravel surface, plant interior	yes
L22631-92	Plant 10 & 11 Composite	33	Gravel surface, n. side of plant	no
L22631-93	Plant 15, 16, 17 & 18 Comp.	35	Ore feed area	yes
L22631-94	Plant 19, 20, 21 & 22 Comp.	15	Fine ore conveyor area	yes

TP Background

* At some of the sites, Hecla personnel had removed approximately 3" to 12" of surface soil prior to sampling.
Note - All sample locations are presented on Plates 2 & 3

TABLE 3
SURFACE SOIL SAMPLES – RADIOLOGICAL (pCi/g)
Hecla Mining Company, Apex Plant
St. George, Utah

Lab ID	Sample Location	Gross Alpha	Gross Beta	Comments	Surface soils cleared*
952182-1	Plant-15, -16, -17, -18	6.9 +/- 5.8	12 +/- 5	Ore feed area	yes
952182-2	Plant-24 and -26	10 +/- 6	18 +/- 6	Material storage, w. side plant	no
952182-3	Ore-1, -2, -3, -4	6.8 +/- 6.1	9.8 +/- 5.3	Ore storage, s. side plant	yes
952182-4	Ore-6, -7, -8, -9	7.2 +/- 6.1	15 +/- 6	Ore storage, s. side plant	yes

* At some of the sites, Hecla personnel had removed approximately 3" to 12" of surface soil prior to sampling.
Note - All sample locations are presented on PLates 2 & 3

4.5 Quality Control

Several types of quality control samples were analyzed to asses the validity of the analytical results discussed in Sections 4.1 through 4.10. These include:

- Field duplicate soil samples to assess the precision of this data. The precision can be affected by laboratory methods, sampling/field protocol, and (especially in the case of soil) sample material inhomogeneity. Duplicate samples on Table 1 are designated with asterisks.

- Matrix Spike/Matrix Spike Duplicates (MS/MSD). Every 20th sample was split into three aliquots to generate both the primary sample result and MS/MSD results. The laboratory added known quantities of target analytes to two of the aliquots (the MS and MSD). The known MS/MSD samples are then analyzed and the results are used to calculate accuracy (the amount of analyte recovered during analysis, expressed as a percent - 100% being completely accurate) and precision (how close the MS and MSD results are to each other, expressed a percent relative difference -0% being completely precise). The laboratory MS/MSD results (included in Appendix D with the laboratory analysis reports) indicate that laboratory results are within acceptable ranges for precision and accuracy.

- Method Blanks. Method blanks were analyzed by the laboratory to assess the potential that contamination of the samples occurred during sample handling at the laboratory.

4.5.1 Field Duplicates

The results of field duplicates indicate that precision between soil samples collected from adjacent locations is generally good. Most of the relative percent differences were better than 30%. This relative percent difference accounts for both the differences introduced by the laboratory in analyzing the two samples, and the natural difference between two soil samples due to inhomogeneity. Therefore, these results appear to be both repeatable and representative of the general soil conditions.

The relative percent duplicates (RPDs) for nine blind duplicate samples are shown on Table 4. The highest reported RPDs are for arsenic and lead on Duplicate 5 and arsenic on Duplicate 8. This is probably partly due to the greater difficulty in obtaining good recoveries for arsenic.

4.5.2 Laboratory MS/MSD Results

The laboratory reported recoveries and RPDs for five of the samples (approximately every 20th sample in the sample set). Recoveries were very good for most of the samples, generally ranging from 90% to 110%, indicating good analytical precision for the sample set.

Overall, the recoveries appeared lowest on the first sample pair they ran, with cadmium, cobalt, lead, nickel and selenium all being slightly below 90%. The only recoveries that were below 80% were selenium on pair 1, and arsenic on pairs 2 and 5. The reported recoveries for these three exceptions ranged from 74% to 78% and were within control limits for the laboratory based on historic results.

The highest recoveries were mercury in pair 3 (118% and 119%) and arsenic in pair 3 (114% and 117%).

Relative percent differences (RPDs) between the MS and MSD samples were generally within 5%, indicating good analytical precision. This indicates that the RPDs seen in duplicate samples (up to about 30%) are primarily caused by inhomogeneity in the samples and sample matrix.

4.5.3 Method Blanks

The laboratory ran five method blanks for metals and TRPH. No concentrations of any of the 12 metals or the TRPH were detected above laboratory reporting limits.

TABLE 4
SUMMARY OF QUALITY CONTROL RESULTS

DUPLICATE SAMPLES

	DUPLICATE 1 Site P3-2			DUPLICATE 2 Site P3-9			DUPLICATE 3 Site Plant-3			DUPLICATE 4 Site Plant-13			DUPLICATE 5 Site Plant-23			DUPLICATE 6 Site Ore-6			DUPLICATE 7 Site P1-5			DUPLICATE 8 Site P3-2			DUPLICATE 9 Windblow-2		
ANALYTE	A	B	RPD	A	B	RPD	A	B	RPD	A	B	RPD	A	B	RPD	A	B	RPD	A	B	RPD	A	B	RPD	A	B	RPD
Arsenic	140	65	36.6	3.6	7.2	-33.3	2.6	2.7	-1.9	1200	930	12.7	36	10	56.5	2.5	3.2	-12.3	17	33	-32.0	15	3.2	64.8	24	27.0	-5.9
Barium	33	23	17.9	67	75	-5.6	76	86	-6.2	310	250	10.7	66	68	-1.5	30	33	-4.8	19	24	-11.6	67	63	3.1	110	110	0.0
Cadmium	10	7.5	14.3	0.8	1.0	-11.1	0.2	0.3	-20.0	35	30.0	7.7	1.3	0.6	36.8	1.1	1.0	4.8	1.2	1.5	-11.1	<0.2	<0.2	NA	0.5	0.6	-9.1
Chromium	190	160	8.6	4.5	6.1	-15.1	7.8	8.4	-3.7	16	15	3.2	9.8	10	-1.0	6.4	6.9	-3.8	4.5	3.4	13.9	7.2	6.1	8.3	9.2	11	-8.9
Cobalt	69	53	13.1	3.5	6.1	-27.1	4.4	5.7	-12.9	280	250	5.7	100	85	8.1	3.2	3.3	-1.5	3.5	3.4	1.4	4.7	3.1	20.5	10	11	-4.8
Copper	40	26	21.2	2.2	4.2	-31.3	7.1	7.5	-2.7	4400	2700	23.9	74	40	29.8	3.4	4.6	-15.0	10	19	-31.0	48	41	7.9	44	43	1.1
Lead	10	9	2.2	6.6	9.7	-19.0	7.2	8.2	-6.5	2500	2300	4.2	89	33	45.9	9.6	9.4	1.1	11	12	-4.3	34	<3.0	NA	45	53	-8.2
Nickel	86	64	14.7	5.5	8.1	-19.1	7.1	7.6	-3.4	110	88	11.1	16	13	10.3	7.1	7.3	-1.4	5.5	5.3	1.9	6.9	4.9	16.9	9.9	11	-5.3
Mercury	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	0.4	0.4	0.0	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA
Selenium	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	1.5	2.0	-14.3	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	0.1	NA
Silver	0.5	<0.5	NA	<0.5	<0.5	NA	1.5	1.7	-6.3	9.5	10	-2.6	0.7	1.0	-17.6	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA
Zinc	6400	4200	20.8	59	150	-43.5	18	19	-2.7	4900	4400	5.4	82	63	13.1	9	12	-14.3	11	22	-33.3	26	16	23.8	77	68	6.2

RPD: Percent duplicate difference.

LABORATORY QUALITY CONTROL

	Lab# 22631-01			Lab# 22631-21			Lab# 22631-41			Lab# 22631-61			Lab# 22631-81		
	%SR			%SR			%SR			%SR			%SR		
ANALYTE	min	max	RPD	min	max	RPD	min	max	RPD	min	max	RPD	min	max	RPD
Arsenic	91.0	101.0	5.3	74.6	74.6	0.0	114.8	117.6	2.4	89.6	95.5	1.8	78.5	83.9	-1.9
Barium	100.0	101.8	-0.8	103.6	103.6	0.0	101.8	105.5	-1.0	103.6	107.3	1.6	106.2	108.7	1.4
Cadmium	88.9	89.8	-0.9	92.2	94.0	1.8	96.7	97.5	0.7	92.4	94.7	2.4	94.9	97.3	2.2
Chromium	91.3	92.2	-0.8	93.8	95.8	1.7	97.8	98.7	-0.7	95.1	97.8	1.9	96.7	99.5	2.4
Cobalt	89.1	89.1	0.0	90.9	92.7	-0.3	98.4	101.5	2.7	92.0	94.5	1.6	94.9	97.6	2.3
Copper	101.8	103.6	-0.3	105.5	110.9	2.0	108.2	108.9	-0.5	106.7	109.8	2.5	101.8	105.5	-0.8
Lead	89.1	89.1	0.0	92.7	96.4	1.0	99.1	99.8	0.5	94.9	96.5	1.5	94.5	96.4	0.7
Nickel	88.4	88.9	-0.4	91.8	93.5	1.3	94.9	96.0	-0.9	91.3	94.0	1.7	94.0	96.9	2.5
Mercury	112.8	116.2	2.9	89.3	93.2	-4.2	118.0	119.0	0.8	95.2	96.2	1.0	95.3	97.7	2.4
Selenium	75.2	77.0	-2.4	85.2	86.0	0.9	101.6	104.0	-2.3	92.4	94.2	-1.9	93.6	96.6	-3.1
Silver	105.5	108.9	3.2	99.1	100.5	1.4	106.7	115.3	7.7	99.1	107.1	7.8	101.6	106.4	4.5
Zinc	96.4	98.2	-0.3	100.0	103.6	1.1	101.8	101.8	0.0	89.1	101.8	0.5	94.5	94.5	0.0

%SR: Percent spike recovery

B:F93QC.WK1

6.0 LIMITATIONS

This report was prepared in general accordance with the accepted standard of practice which exists in Utah at the time the sampling was performed. Care was taken during sampling to collect representative samples. If the client wishes to reduce the uncertainty beyond the level associated with this survey, Kleinfelder should be notified for additional consultation. This report is not intended for use as an abatement removal plan or specification document.

Our firm has prepared this report for the Client's exclusive use for this particular project and in accordance with generally accepted practices within Utah at the time of the investigation. No other representations, expressed or implied, and no warranty or guarantee is included or intended.

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Sampling and Analysis Plan
Hecla Mining Company, Apex Plant
St. George, Utah

May 18, 1995

Prepared For:

Hecla Mining Company
6500 Mineral Drive
Coeur d'Alene, Idaho

Kleinfelder File No. 31-6930-60

Sample and Analysis Plan
Hecla Mining Company - Apex Plant
St. George, Utah

Prepared by:

Renee D. Zollinger, R.G.
Senior Geologist

Hiram Alba, P.E.
Branch Manager

KLEINFELDER, INC.
2749 E. Parley's Way, Suite 100
Salt Lake City, Utah 84109

May 18, 1995

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1.0 INTRODUCTION

1.1 BACKGROUND

Hecla Mining Company's Apex Plant is located approximately 10 miles west of St. George, Utah. The plant has been operated by Hecla Mining Company for approximately six years. Prior to 1989, the Apex Plant was operated for four years by the St. George Mining Company to process ores mined from the Apex Mine. The St. George Mining Company primarily extracted Germanium (Ge) and Gallium (Ga) from the ore. Hecla Mining Company began extracting Ge and Ga from the ore, but has primarily been producing cobalt since 1992. Currently, the cobalt is extracted from spent petroleum catalysts rather than from ore.

The Apex Facility is approximately 100 acres in size. There are four historic tailings/process ponds and a surge pond that were cleaned out between 1990 and 1992, and two areas where ore was stored. One additional pond (Pond 2) is currently used to store the material that was removed from the other five ponds. This pond will likely be capped, and is not part of the proposed sampling plan.

1.2 OBJECTIVES

Hecla Mining Company wishes to assess the potential that metals may have impacted surface soils at the Apex Plant facility. Samples will be collected from areas where ore tailings, or process wastes were stored, from the area where ore and other material was processed and from general areas around the plant site which may be affected by wind blown metals or spillage. Additionally, surface soils in areas around the plant buildings where kerosene-based solvents were used will be assessed for total petroleum hydrocarbons. Some of the samples collected will be analyzed for alpha/beta radiation to confirm that no radioactive materials have been processed at the site.

2.0 FIELD SAMPLING PLAN

2.1 FIELD PREPARATION

Before performing work in the field, environmental staff will review the scope of work, coordinate the work to be done with the project manager, assemble the necessary sample containers, and clean equipment to be used in the field. A site-specific health and safety plan will be prepared that describes expected and potential hazards and appropriate emergency procedures and contacts. The health and safety form that will be filled out and used by the field crew is contained in Appendix A. The Hecla Site Manager will be contacted in advance to coordinate the time and location of sampling activities.

2.2 SAMPLE LOCATIONS

Several areas will be targeted for sampling to assess current site conditions. The areas to be sampled are discussed below and are shown on Plate 2.

Tailings/Process Ponds - Five ponds which were used to hold tailings or processing by-products and wastes are now cleaned out. These ponds are as follows:

Pond Name	Historic Contents	Liner
2A	Ore Tailings	Hypalon
1C	Arsenic Still Bottoms	Spray-on Asphalt
3B North	Zinc Sulfate or Iron Sulfate	Spray-on Asphalt
3B South	Zinc Sulfate or Iron Sulfate	Spray-on Asphalt
Surge Pond	Various	Hypalon

The contents of the ponds and pond liners were removed to Pond 2 in 1990 through 1992.

Surface soils from the bottom of each pond will be sampled. Four samples will be collected from the bottom of each pond, and two samples will be collected from half way up the berm around each of the five ponds.

Ore Storage Areas - Ore was placed in a large storage area east of the plant and a small area north of the plant. Eight samples will be collected from within the large storage area. Two additional samples will be collected from the smaller area where ore was also stored.

Plant/Process Area - Ore was processed in the plant area. Processing involved feeding ore into the plant through a hopper located near the large storage area. From there, the ore was transported to a shaker screen and ball mill. The pulverized ore was then placed in approximately 15 tanks where sulfuric acid was added to dissolve the ore. A variety of extraction processes, including a kerosene-based solvent extraction process, were then used to recover metals of interest. Wastes and by-products were piped (via above-ground piping) to the process ponds described above.

Approximately 20 to 30 surface soil samples will be collected in the plant area, including around the perimeter of the paved plant area and within any unpaved portions of the plant area. In general, four samples will be collected from each identified process area (e.g., around the solvent extraction unit, in the feed areas, etc.). More samples will be collected in areas that are large or that appear to be highly variable in nature.

General Site Area - Approximately 20-30 surface soil samples will be collected from other "non-target" areas of the property, such as roadways and the area around the ponds. These samples will be collected primarily to assess the potential for impacts by windblown contaminants. Random sample locations will be selected in the field, based on access and site conditions. Locations will be selected to provide general overall site coverage.

Background - A minimum of four soil samples will be collected to assess background metals concentrations. If heterogeneous soils are encountered, up to eight background samples may be collected. Two background soil samples will be collected from the topsoil stockpile created when the plant area was initially excavated in approximately 1985. This stockpile is located just north of the plant area. Two additional samples will be collected from undisturbed areas outside the Apex facility that are unlikely to be impacted by site activities. If the in-place soils are notably heterogeneous, up to four additional samples will be collected from around the facility.

2.3 SURFACE SOIL SAMPLING PROTOCOL

At each sample location, the upper 1 to 2 inches of loose soil and debris will be cleared away. A clean 6-inch long, 2.5-inch diameter stainless steel tube will then be driven vertically into the ground in order to collect a relatively undisturbed sample. The soil around the sample tube will be carefully loosened with a shovel or hand auger so that the sample tube can be removed from the ground.

Once the tube is extracted from the ground, the ends of the tube will be covered with Teflon and sealed with tight-fitting plastic caps. The top and bottom of the tube will be marked "T" and "B", respectively.

After each sample is collected, it will be individually labeled. The label will include Kleinfelder's name, job number, the date and time the sample was collected, the employee number of the individual who performed the sampling, and a unique sample identification number. A custody seal will also be placed on the sample in such a way that any attempt to tamper with the sample is easily visible.

2.4 QA/QC SAMPLE COLLECTION

Several types of quality assurance/ quality control (QA/QC) samples will be collected so that the quality of the analytical data can be assessed. These samples are as follows:

Blind Duplicates - At approximately 10% of the sample locations, a duplicate surface soil sample will be collected. Duplicate samples will be collected by driving a second sample tube into the ground adjacent to the primary sample tube. These duplicate samples will be blind (i.e., they will not be identified as duplicates to the analytical laboratory). The degree to which analytical results for duplicate samples are repeatable is a measure of both laboratory precision and sample representativeness.

Matrix Spike/ Matrix Spike Duplicates (MS/MSD) - In order to assess laboratory precision and accuracy, every 20th sample will also be run as an MS/MSD sample. To obtain these results, the laboratory will digest three aliquots from a single sample tube. The first aliquot will be analyzed and reported as the primary sample. The next two aliquots will have a know amount of the requested analytes added (spiked). The laboratory will then analyze these two aliquots (referred to as the matrix spike and the matrix spike duplicate).

The results of the MS/MSD samples are compared with the known (spiked) concentration and with each other to assess accuracy and precision, respectively.

Field Blank - One field blank will be prepared by pouring deionized water into appropriate sample bottles. This sample provides information on whether the primary samples are being impacted during collection by airborne/fugitive metals, or whether the sample set may be impacted during sample handling, transport, or analysis.

All QA/AC samples will be collected, handled, and transported with the primary samples.

2.5 SAMPLE HANDLING

After securing and labeling each sample, sample information will be recorded on the chain-of-custody and on a Sample Control Log. Each sample will then be immediately stored in an iced cooler for transport to the analytical laboratory. The chain-of-custody form will accompany the cooler at all times. The chain-of-custody form includes Kleinfelder's name, address and telephone number, the date and time the samples were collected, the number of containers each sample occupies, and the analyses for which the samples are being submitted. The chain-of-custody form is signed by each person who handles the samples, including all Kleinfelder employees and the analytical laboratory when the samples are delivered. Examples of the chain-of-custody form and a Sample Control Log are contained in Appendix A. The sample control log identifies sample location information for each sample on the chain-of-custody. This sample location information is not provided to the analytical laboratory.

2.6 DECONTAMINATION

To reduce the potential for introducing contamination into the samples, the sample tubes will be cleaned prior to sample collection. The tubes will be cleaned using a detergent wash, followed by a steam rinse. No other equipment will be used that will come in contact with the soil samples.

3.0 LABORATORY ANALYSIS PLAN

3.1 SAMPLE ANALYSIS

One soil sample from the 0 to 6-inch depth interval at each location will be submitted to American West Analytical Laboratories in Salt Lake City, Utah for analysis. American West will be asked to use soil from the top 2 inches of the sample tube when they take a portion of the sample for digestion/analysis of metals. The bottom four inches of soil in tubes from targeted process areas in the plant will be composited and analyzed to confirm that metals do not extend to that depth. The samples will be submitted for analysis of pollutant metals. Selected samples will also be analyzed for total petroleum hydrocarbons (TPH) by infrared radiation (IR) and for gross alpha/beta radiation. American West Analytical Laboratories is certified by EPA and the State of Utah for the required analyses, with the exception of gross alpha/beta radiation. This analysis will be performed by Berringer Laboratories of Golden, Colorado. The analytical methods and other sample requirements are summarized on Table 1.

TABLE 1
LABORATORY ANALYSES AND REQUIREMENTS
SOIL SAMPLES

Analyte	Analysis Method	Sample Container	Preservative	Holding Time+	Storage Temperature	Reporting Limit**
Arsenic	7060	SS tube*	None	6 months	4°C	0.5
Barium	6010	SS tube	None	6 months	4°C	0.5
Cadmium	6010	SS tube	None	6 months	4°C	0.2
Chromium	6010	SS tube	None	6 months	4°C	0.5
Cobalt	6010	SS tube	None	6 months	4°C	0.5
Copper	6010	SS tube	None	6 months	4°C	0.5
Lead	6010	SS tube	None	6 months	4°C	3.0
Mercury	7471	SS tube	None	28 days	4°C	0.1
Nickel	6010	SS tube	None	6 months	4°C	0.5
Selenium	7740	SS tube	None	6 months	4°C	0.1
Silver	6010	SS tube	None	6 months	4°C	0.5
Zinc	6010	SS tube	None	6 months	4°C	0.5
TPH	418.1	SS tube	None	14 days	4°C	5.0
α Rad.	9030	SS tube	None	None	4°C	2-4 pc/g
β Rad.	9030	SS tube	None	None	4°C	3-6 pc/g

* SS tube = Stainless Steel tube
** Expected reporting limit, in the absence of matrix interference, in **mg/kg**

3.2 LABORATORY QUALITY CONTROL

The laboratory will provide Method Blank (MB) and Laboratory Quality Control Sample (LQCS) data associated with the sample results so that the accuracy and precision of the results can be assessed.

3.3 DATA VALIDATION

The field documentation and laboratory QC data will be reviewed to assess the validity of the results for various applications. The data will be assigned Kleinfelder's validation qualifiers, as shown on Table 2. The validation process will indicate the type of applications the data may be used for in future investigations, if necessary.

TABLE 2
DESCRIPTION AND CROSS–REFERENCE FOR VALIDATION QUALIFIERS

KLEINFELDER VALIDATION QUALIFIER	EPA VALIDATION QUALIFIER*	MEANING OF KLEINFELDER VALIDATION QUALIFIER
none	none	Valid, no qualifier attached, result > CRL, usable in quantitative risk assessments and other Level I through IV applications
none	U	Valid data, "none detected". May be used in quantitative risk assessments and other Level I through IV applications
1a	J	Estimated quantity, result is > IDL but < CRL Data is usable in quan. risk assessments & other Level I – IV
1b	J	Estimated quantity, lab. QA samples out of precision limits Data is usable in quan. risk assessments & other Level I – IV
1c	J	Estimated quantity, RL raised due to matrix interference Data is usable in quan. risk assessments & other Level I – IV
1d	J	Estimated quantity, field QA samples out of precision limits Data is usable in quan. risk assessments & other Level I – IV
2a	R	Rejected: Common lab contaminant, result is < 5*RL or < 10*blank concentration (described as commen in RAGS)
2b	R	Rejected: Suspected lab contaminant, result is < 5*RL or < 5*blank concentration
2c	R	Rejected for quantitative risk assessment: quantitation limits raised unacceptably high due to matrix or analyte interference This data may be used for some screening purposes and for planning additional or confirmation field investigations
2d	R	Rejected for quantitative risk assessment, lab or field QA sample too far out of project precision limits Subjective decision, to be made by risk assessor
3a	none	May be used in quantitative risk assessment. Assessor may use judgement, depending on data qualified as "2a". Indicates that result is a common lab. contaminant, but result is > 5*IDL and > 10 * blank concentration
3b	none	May be used in quantitative risk assessment. Assessor may use judgement, depending on data qualified as "2b". Indicates that result may be a lab. contaminant, but result is > 5* IDL and > 10 * blank concentration
4	N	Assessor must use judgement on whether to include in quantitative risk assessment: Tentatively Identified Compound
5a	J	Estimated quantity: Missed holding times, assessor judged data to be useful in risk assessment due to little expected effect
5b	R	Rejected data: Missed holding times, assessor judged data to be compromised due to expected effect
6a	R	Rejected in quantitative risk assessment: sample is a true duplicate of another sample
6b	none	Acceptable for use in quantitative risk assessment. Sample is a field "duplicate" but results indicate that sample is independent of primary sample

* EPA Validation Qualifiers for quantitative risk assessment are listed in RAGS, Exhibit 5–5

KLEINFELDER SAMPLE CONTROL LOG

Project Name:_____ Project Number:_____ Date(s) of Field Work: _____

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes

KLEINFELDER

PROJ. NO.	PROJECT NAME	NO. OF CON-TAINERS	ANALYSIS	REMARKS
L.P. NO. (P.O. NO.)	SAMPLERS: (Signature/Number)			
DATE MM/DD/YY	SAMPLE I.D. TIME HH:MM:SS / SAMPLE I.D.			

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Remarks	Send Results To
Relinquished by: (Signature)	Date/Time	Received by: (Signature)		KLEINFELDER 2605 EAST 3300 SOUTH SALT LAKE CITY, UT 84109 (801) 466-6769
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)		

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

№ 0147

CHAIN OF CUSTODY

HEALTH AND SAFETY PLAN

Project No. 31-6930-60 Date 5/19/95

Client Hecla Mining Company Address 6500 Mineral Drive, Coeur d'Alene, Idah

Client/Site Contact Jim Weber/ Penny Bassett Client/Site Phone Number (801) 628-1635

Job Location Hecla Mining Company, apex Plant, St. George, Utah

Work Objectives Collect Soil Samples

Key Individuals - - - -Project Manager Renee Zollinger

Site Health and Safety Daniel Horns

Preparer Daniel Horns Reviewer/Approver

Hospital/Clinic Dixie Regional Medical Center Phone 634-4200

Hospital Address 544 South 400 East

Paramedic 911 Fire Dept. 911 Police Dept. 911

Emergency/Contingency Plans Apply first aid on-site, phone 911, transport to hospital or wait for ambulance, as needed.

____ 15 Minute Eyewash x Fire Extinguisher x First Aid Kit

Site Control Measures

Personal Decontamination Procedures

CHEMICAL HAZARDS

Chemical Name (CAS#)	Expected Water/ Soil Concentration	Health Hazards
None expected		

PHYSICAL HAZARDS

x Heat	x Slip,Trip,Fall	x Excavations/Trenches
_____ Cold	_____ Noise	_____ Moving Equipment
_____ Rain	_____ Underground Hazards	x Other Hand tools
_____ Fog	_____ Overhead Hazards	_____

PERSONAL PROTECTIVE EQUIPMENT- R = Required A = As Needed

_____ Hard Hat	R Safety Eyewear (Type) _____
R Safety Boots	_____ Respirator (Type) _____
_____ Orange Vest	Filter Type _____
_____ Hearing Protection	_____ Gloves (Type) _____
_____ Tyvek Coveralls	_____ Other _____
_____ 5 Minute Escape Respirator	_____

MONITORING EQUIPMENT

_____ Organic Vapor Analyzer	_____ PID with lamp of ____ eV
_____ Oxygen Meter	_____ Draeger Tube _____
_____ Combustible Gas Meter	_____ Passive Dosimeter
_____ H_2S Meter	_____ Air Sampling Pump
_____ W.B.G.T.	Filter Media _____

ONSITE SAFETY MEETING ATTENDEES

Signature	Name (Printed)	Date

PERSONAL AIR MONITORING

Sample # _____	Sample # _____
Name _____	Name _____
Date _____	Date _____
Time On _____ Off _____	Time On _____ Off _____

Laboratory Used _____

KLEINFELDER SAMPLE CONTROL LOG

Project Name: Hecla/Apex Project Number: 31-693060 Date(s) of Field Work: 5/23/95

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
8:45	5/23/95	HM0523 95-01	30' South of SW Plant 1	Soil	1	Steel Tube	N	N	* Silty Sandy Gravel (60-80% Gravel) + Silty Clay w/ Gravel (20-40% Gravel) * Scraped
									*
9:05	5/23/95	HM0523 95-02	Plant 2	Soil	1	steel Tube	N	N	* Spotty staining TPH Scraped
9:30	"	HM0523 95-03	Plant 3	"	"	"	"	"	+ East of Kerosene tanks TPH cleared Driven
9:35	"	HM0523 95-04	Plant 3	"	"	"	"	"	+ Dup of 5 Driven
9:50	"	HM0523 95-05	Plant 4	"	"	"	"	"	* East of Kerosene TPH split Scraped
10:00	"	HM0523 95-06	Plant 5	"	"	"	"	"	East of Kerosene * Pink spots on soil Scraped
10:15	"	HM0523 95-07	Plant 6	"	"				+ cleared split Driven
10:30	"	HM0523 95-08	Plant 7	"	"	"	"	"	* TPH (Stained soil nearby) Scraped
10:35	"	HM0523 95-09	Plant 8	"	"	"	"	"	* Scraped
10:50	"	HM0523 95-10	Plant 9	"	"	"	"	"	* Scraped
11:00	"	HM0523 95-11	Plant 10	"	"	"	"	"	* Split Sample Scraped
11:10	"	HM0523 95-12	Plant 11	"	"	"	"	"	Scraped
11:20	"	HM0523 95-13	Plant 12	"	"	"	"	"	Scraped
11:30	"	HM0523 95-14	Plant 13						Area had been cleared Next to concrete pad, not on map. Scraped split
11:40	"	HM0523 95-15	Plant 13	"					DUP 5 TPH (near stained soils) Scraped
11:50	"	HM0523 95-16	Plant 14	"	"	"	"	"	cleared

Cleaved = Hecla has scraped-off top 3"-6"

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: Hecla/Apex Mine Project Number: 31-693060 Date(s) of Field Work: 5/23/95

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
12:00	5/23/95	HM0523 95-17	Plant 15	Soil	1	Steel Tube	N	N	cleared, scraped
12:05	"	HM0523 95-18	Plant 16	"	"	"	"	"	cleared, scraped
12:10	5/23/95	HM0523 95-19	Plant 17	"	"	"	"	"	+ scraped
12:15	"	HM0523 95-20	Plant 18	"	"	"	"	"	cleared, scraped
12:50	"	HM0523 95-21	Plant 19	"	"	"	"	"	+ cleared, scraped
12:55	"	HM0523 95-22	Plant 20	"	"	"	"	"	+ "
13:00	"	HM0523 95-23	Plant 21	"	"	"	"	"	+ "
13:05	"	HM0523 95-24	Plant 22	"	"	"	"	"	+ "
13:10	"	HM0523 95-25	Plant 23	"	"	"	"	"	+ "
13:15	"	HM0523 95-26	Plant 23	"	"	"	"	"	+ "
13:20	"	HM0523 95-27	Plant 24	"	"	"	"	"	+ not cleared, scraped Near residual "slurry" cobalt product
13:25	"	HM0523 95-28	Plant 25	"	"	"	"	"	+ cleared, scraped
13:40	"	HM0523 95-29	Plant 26	"	"	"	"	"	+ scraped
14:00	"	HM0523 95-30	ore 1	"	"	"	"	"	* cleared, scraped
14:05	"	HM0523 95-31	ore 2	"	"	"	"	"	* cleared, scraped
14:05	"	HM0523 95-32	ore 3	"	"	"	"	"	* cleared, scraped
14:10	"	HM0523 95-33	ore 4	"	"	"	"	"	* cleared, scraped
14:15	"	Field Blank	Field Blank	Water	2	80z liter			

cleared = topsoil had been removed

scraped = sample collected by loosening soil w/ chisel & collecting loose soil by hand

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: 31-693060 Project Number: _____ Date(s) of Field Work: 5/23/95

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
14:35	5/23/95	HM0523 95-34	ore5	Soil	1	S.S. Tube	4°C	N	Scraped, cleaned +
14:45	"	HM0523 95-35	ore6	"	"	"	"	"	+ " "
14:50	"	HM0523 95-36	ore6	"	"	"	"	"	+ Dups " "
14:55	"	HM0523 95-37	Ore 7	"	"	"	"	"	+ " "
14:55	"	HM0523 95-38	ore 8	"	"	"	"	"	+ Scraped, clean Just North of lone pinon tree
15:05	"	HM0523 95-39	ore 9	"	"	"	"	"	+ ~~Scraped~~, cleaned Driven
15:40	"	AM0523 95-40	ore 10	"	"	"	"	"	Measured from NE corner of Lab bldg + Driven, cleaned
15:40	"	HM0523 95-41	ore 4	"	"	"	"	"	Driven, cleaned
15:50	"	HM0523 95-42	BG1 ~~BG1~~	"	"	"	"	"	+ Driven + dug 8" before sampling
16:00	"	HM0523 95-43	BG2	"	"	"	"	"	+ Driven, dug 8" before sampling
16:30	"	HM0523 95-44	P3-1	"	"	"	"	"	* Cleaned, Scraped
16:35	"	HM0523 95-46	P3-2	"	"	"	"	"	* cleaned, Scraped
16:40	"	HM0523 95-45	P3-2	"	"	"	"	"	* cleaned. Scraped Dups
16:45	"	HM0523 95-47	P3-14	"	"	"	"	"	* cleaned Scraped
16:55	"	HM0523 95-48	P3-3	"	"	"	"	"	* " "
17:00	"	HM0523 95-49	BG-3	"	"	"	"	"	+ Dug ≈ 12" w/ shovel + 4" w/ clean chisel. Collected sample by driving tube
17:10	"	HM0523 95-50	BG-4	"	"	"	"	"	

Taken out of sequence

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: Hecla Mining Project Number: 31-693060 Date(s) of Field Work: 5/24/95

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
7:30	5/24/95	~~HM024~~ HM0524 95-01	P2-1	Soil	1	5-5 tube			+ Scraped, cleaned
7:35	"	HM0524 95-02	P2-6	Soil	1	"			+ ~~scraped~~ Driven, not cleaned
7:40	"	HM0524 95-03	P2-2	"	"	"			* scraped, cleaned
7:45	"	HM0524 95-04	P2-3	"	"	"	"		* Scraped, Cleaned
7:50	"	HM0524 95-05	P2-3	"	"	"	"		* Scraped Cleaned Dups
7:55	"	HM0524 95-06	P2-5	"	"	"			* Driven
8:00	"	HM0524 95-07	P2-4	"	"	"			*Scraped, Cleaned
8:15	"	HM0524 95-08	P3-4	"	"	"			*Scraped, cleaned
8:20	"	HM0524 95-09	P3-5	"	"	"			* Scraped Cleaned
8:30	"	HM0524 95-10	P3-13	"	"	"			*scraped, not cleaned
~~8:45~~ 8:42	"	HM0524 95-11	P3-6	"	"	"			*scraped, cleaned
8:45	"	HM0524 95-12	P3-7	"	"	"			* Scraped, cleaned
8:50	"	HM0524 95-13	P3-12	"	"	"			* Scraped
9:00	"	HM0524 95-14	P3-11	"	"	"			" "
9:05	"	HM0524 95-15	P3-10	"	"	"			* Scraped, Cleaned
9:10	"	HM0524 95-16	P3-9	"	"	"			" "
9:15	"	HM0524 95-17	P3-9	"	"	"			" " Dups
9:20	"	HM0524 95-18	P3-9	"	"				" "

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: Hecla Mining Project Number: 31-693060 Date(s) of Field Work: 5/24/95

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
9:30	5/24/95	HMO524 95-19	P1-1	Soil	1	Steel Tube	N	N	* Scraped cleared
9:35	5/24/95	HMO5 2445-20	P1-2	"	"	"	"	"	* Scraped cleared scraped
9:45	5/24/95	HMO524 95-21	P1-6	"	"	"	"	"	* Scraped.
9:50	"	HMO524 95-22	P1-3	"	"	"	"	"	* Scraped cleared
9:55	"	HMO524 95-23	P1-4	"	"	"	"	"	* Scraped, Cleared
10:00	"	HMO524 95-24	P1-5	"	"	"	"	"	* Scraped
10:05	"	HMO524 95-25	P1-5	"	"	"	"	"	* Not Scraped Ditches
10:15	"	HMO5211 95-26	SP-1	"	"	"	"	"	* East facing stock pile face 270' NW of NW corner of Pond 1 measured along diagonal of Pond SP1 20' south of SP2
10:20	"	HMO524 95-27	SP2	"	"	"	"	"	
10:40	"	HMO524 95-28	Wind blow 1	"	"	"	"	"	* Sample located 155' SE of Pond 1 @ a Pt. measured in line with NE Pond edge
11:00	"	HMO524 95-29	S-1	"	"	"	"		Surge Pond- measure along diagonal from SE corner of Pond. S1=15'
11:05	"	HMO524 95-30	S-2	"	"	"	"	"	S2=35' *. Scraped, not cleared
11:10	"	HMO524 95-31	S-3	"	"	"	"	"	S3=62' " "
11:15	"	HMO524 95-32	S-4	"	"	"	"	"	S4=90'
11:25	"	HMO529 95-33	Wind blow 2	"	"	"	"	"	measure South from center of SE edge of Surge Pond, 123 feet perpendicular to pole line. Samples upper 1" of soil
11:30		HMO524 95-34	Wind blow 2	"	"	"	"	"	

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: Hecla Mining Project Number: 31-6430 60 Date(s) of Field Work: 5/24/95

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
11:50	5/24/95	HM0524 95-35	BG-5	S	1	S.S. Tube	N	N	* 74' W. of Road (Entrance to mill)
11:55	5/24/95	HM0524 95-36	BG6	"	"	"	"	"	* 120' W of Road (Entrance to mill)
[illegible]	[illegible]	[illegible]	[illegible]	"	"	"	"		Both BG-5 & BG-6 are 56' north along road from main Gate
12:05	5/24/95	HM0524 95-37	BG-7	"	"	"	"	"	approx. 100 feet South of main paved road from St George, ≈ 300' NE of The turnoff to Hecla. + pounded (very clayey)

SampCont.WK1

KLEINFELDER

2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DAILY FIELD REPORT

DATE 5/22/95	JOB NO. 31-693060.001
PROJECT Hecla / Apex Mine	
LOCATION St. George	
CONTRACTOR	OWNER
WEATHER Windy / Warm	TEMP. 75° °at 14:00 AM °at PM
PRESENT AT SITE Danny Horns, Mark Christensen	
TYPE OF INSPECTION Site Tour, Surveying	

The following was noted:

14:20 - Met with Penny Bassett
- She provided a map of the plant area
- We took a tour of the plant area and Ponds and ore sites
- We noted several targets for sampling around the plant area (see highlights on plant map)
- We'll have to dig through gravels to sample at ore site south of plant

15:00 - Starting to survey sample sites in ponds. We set up a coordinate base in the northeast corner of each pond (at the top of the berm, inside the curve, at the center of the curve). Sample sites were measured relative to the northeast corner in feet northwest (parallel to northeast side of pond) and feet southwest (parallel to southeast side of pond. See ϕ map on next page for example.

Received & Acknowledged by:

Signed: Danny Horns
KLEINFELDER

Representing:

Date: 5/22/95

L-29A

KLEINFELDER

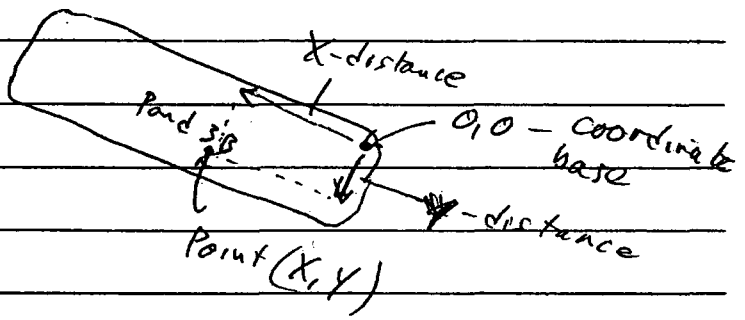
2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE 5/22/95	JOB NO. 31-6930 60
PROJECT	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

Example of measurement ~~[illegible]~~ method



– Ponds 3B north + 3B south were treated as one, since the dividing berm on the map is no longer in-place.

Sample Sites in Pond 3B

Site #	X (NW) distance	Y (SW) distance
P3-1	100	50
P3-2	200	100
P3-3	285	50
P3-4	400	100
P3-5	500	50
P3-6	600	100
P3-7	700	50

Site #	X	Y	
P3-8	800	100	
P3-9	900	50	
P3-10	1000	90	
P3-11	1000	-10	Berm Samples
P3-12	700	140	
P3-13	400	-8	
P3-14	100	140	

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Representing:

Date: 5/22/95

L-29A

KLEINFELDER

2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE 5/22	JOB NO. 31-693060
PROJECT	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

Sample sites for Pond 1C

Site #	X (NW)	Y (SW)	Site #	X	Y	
P1-1	80	80	P1-4	160	160	
P1-2	160	80	P1-5	120	210	Berm sites
P1-3	80	160	P1-6	120	10	Berm sites

Sample sites for Pond 2A

Site #	X (NW)	Y (SW)	Site #	X	Y	
P2-1	100	100	P2-4	200	200	
P2-2	250	100	P2-5	150	300	Berm sites
P2-3	100	200	P2-6	175	25	Berm sites

- Because Pond 3B is so large, there are ten sample sites, instead of the 8 that would be called for by the sampling plan.
- Surveying was done w/ measuring tape, siting parallel and perpendicular to the pond edges.
- Each site was staked w/ a numbered stake

Received & Acknowledged by:

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Representing:

Date: 5/22/95

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(801) 466-6769

DAILY FIELD REPORT

DATE 5/23/95	JOB NO. 31-693060
PROJECT Hecla Mine	
LOCATION St George	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE Dan Horns, Mark Christensen "Buck" @ Schmidt from G+M	
TYPE OF INSPECTION Soil Sampling	

The following was noted:

- Mark + I measured sample sites for stockpile, using intersection of SE edge of pile + road on SW side of pile for reference.

Stockpile Samples:

Sample #	location
BG (Background)-1	100' from road, along SE edge of pile
BG 2	325' NW along road, 10' perpendicular to road, along NW edge of pile (note: the northwest edge of pile is further SE than shown on map. Appears to have been excavated).

- Met Buck. Penny Bassett gave us a site tour
- Sampled 26 sites around the active plant. Site locations are shown on the 1"=30' map of the plant. Sites were surveyed relative to permanent plant fixtures (e.g. building corners, etc.) Reference points are shown as ⊕ on map

Received & Acknowledged by:

Signed: David Horns
KLEINFELDER

Representing:

Date: 5/23/95

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2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE	JOB NO.
5/23/95	31-693060
PROJECT: Hecla	
LOCATION:	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

- Collected samples from large ore storage area, south of plant. Used southern-most of four adjacent phone poles as a reference. X-direction = perpendicular to local pole-line, (positive = north)
Y = parallel to pole line (positive = East)

Site #	X (north)	Y (east)
Ore 1	120	0
Ore 2	120	80
Ore 3	120	160
Ore 4	120	240

Site #	X	Y
ore 5	-120	-38
ore 6	-120	-62
ore 7	-120	162
ore 8	-120	262
ore 9	-120	362

- Collected samples from ore storage north of plant. Used Reference from NE corner of lab building. X = North (parallel to NE building edge), Y = East (⊥ to X-line)

Site #	X	Y
Ore 10	250	45
Ore 11	250	80

Received & Acknowledged by:

Signed: Daniel Horn
KLEINFELDER

Representing:

Date: 5/23/95

KLEINFELDER

2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE 5/23/95	JOB NO. 31-6930 60
PROJECT Hecla Mine	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

- Collected samples from pre-surveyed soil stockpile (BG-1 & BG-2
- Collected four samples from pre-survey Pond 3 (P3-1, P3-2, P3-3, and P3-14)
- Collected background soil samples from east of pond 3 (BG-3 = 360 feet from SE corner of pond, measured parallel to NE edge of pond, BG-4 = 375' from SE corner). We will collect another background soil sample from SW of the plant. There appears to be two principal sources of detrital soil: Hills to west & Hills to east. BG-3 & BG-4 should be representative of soil derived from hill to east.
- Saw two principal soil types in area: a silty sandy gravel (60-80% gravel) and a gravelly clay (30-40% gravel). On sample control, those samples that were gravel have a * in the note column, gravelly clays have a + in the note column.

Received & Acknowledged by:

Signed: Daniel Hoare
KLEINFELDER

Representing: _____ Date: 5/23/95

L-29A

KLEINFELDER

2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE 5/23/95	JOB NO. 31-69306D
PROJECT Hecla	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

- Almost all soils were too gravelly & hard to sample by driving tube into ground. Instead, we loosened soil w/ a clean chisel (cleaned w/ non-phosphate wash and de-ionized rinse), and loaded loose soil into cylinders by hand. We tried to minimize contact between chisel & samples. We generated ≥ gallons of decon & rinse water, this was deposited in the process-waste land fill (still is an active land fill w/ standing water). (we cleared this with Penny Bassett prior to doing any dec
- Samples collected by method described above noted w/ "scraped" in notes column of sample control. Samples collected by driving tube noted w/ "driven" in notes column.
- Some sample sites had topsoil removed by Hecla prior to our sampling. Those are noted w/ "cleaned" in notes column of sample control.
- We always removed at least 1" of soil prior to sampling. Other site-specific sampling practices are noted in the "notes" column of the sample control log.

Received & Acknowledged by:

Signed: David Horns
KLEINFELDER

Representing:

Date: 5/23/95

L-29A

KLEINFELDER
2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE 5/24/95	JOB NO. 31-693060
PROJECT Hecla Mining	
LOCATION St. George / Apex facility	
CONTRACTOR	OWNER
WEATHER Rainy	TEMP. 60° °at 7:00 AM °at PM
PRESENT AT SITE Dan Horns, Mark Christensen	
Buck Schmidt from G+M	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

7:00 - Started sampling pre-surveyed ~~points~~ sites at Pond 2 (P2-1 → P2
- Sampled remaining pre-surveyed sites at Pond 3 (Sites P3-4 through P3-13)
- Sampled pre-surveyed sites at Pond 1 (P1-1 through P1-6)
- There is a relatively fresh-looking soil pile just north of the stockpile from the building excavation (i.e., just north of pile sampled at sites BG-1 & BG-2). We collected 2 samples from the SE side of this northern stockpile (sites SP-1 + SP-2). The surveying for these sites is described on ~~drawing~~ sample-control log
- Collected a "windblow" sample from SE of pond 1. Site "Windblow-1" is 155' SE of the 0,0 point at ~~NE~~ SE corner of Pond 1, measured parallel to NE edge of the pond. Sample was collected from the top 1" of soil.

Received & Acknowledged by:

Signed: _____
KLEINFELDER

Representing: _____ Date: _____

L-29A

KLEINFELDER

2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE 5/24/15	JOB NO. 31-6930 60
PROJECT Hecla Mining	
LOCATION Apex facility, St. George	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

- Collected four samples from the Surge Pond. The samples were collected along a diagonal line from the SE corner to the NW corner of the pond. Sample Sites S-1, S-2, S-3, and S-4 were 15', 35', 62', and 90' from the inside of the SE corner, respectively. Standing water in the bottom of the pond prevented us from getting a more even sample distribution.
- Collected another windblow sample from SE of the surge pond, NE of the main ore storage area. Site Windblow 2 is 123 feet SE from the center of the SE edge of the Surge pond, measured perpendicular to the pole line to the east. This sample was collected by scraping the top 1" of soil.
- Collected background samples from west of the main gate to the plant. Sites BG-5 and BG-6 are SW (uphill) from the road leading to the plant, 56' NW of the NW side of the main gate. Site BG-5 is 74' west of the road, BG-6 is 117' west of the road.

Received & Acknowledged by: _____

Signed: _____
KLEINFELDER

Representing: _____ Date: _____

KLEINFELDER

2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109
(801) 466-6769

DATE 5/24/95	JOB NO. 31-613060
PROJECT Hecla Mining	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP. °at AM °at PM
PRESENT AT SITE	
TYPE OF INSPECTION	

DAILY FIELD REPORT

The following was noted:

- Collected a background sample all the way back at Hwy 91, ≈ 0.7 miles NW of the plant. Site BG-7 is ≈ 100 feet southeast of the Highway, ≈ 300 feet NE of the turnoff to the Hecla / Apex facility.
- We discharged ≈ 1½ gallons of decon & rinse water into the active landfill / pond at the facility.
- We made copies of maps and sample control logs for Buck.
- We left copies of the field notes for 5/22 & 5/23 with Penny Bassett.

Received & Acknowledged by:

Signed: _____
KLEINFELDER

Representing: _____ Date: _____

KLEINFELDER

PROJ NO	PROJECT NAME	NO OF CONTAINERS	ANALYSIS													LAB # 22631
	31-6930 60		Metals *	TPH / 418.1	α+β Radium / 9030											16 5
L.P. NO P.O. NO.:	SAMPLERS: (Signature/Number) Daniel Horns / 2362															

DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.														REMARKS
5/23/95	8:45	HMOS2395-01	1	X	X											~~composite w/ HMOS2395-13 for TPH~~
	9:05	HMOS2395-02	1	X	X											composite w/ HMOS2395-14 for TPH
	9:30	HMOS2395-03	1	X	X											composite HMOS2395-03 - 04 for TPH
	9:35	HMOS2395-04	1	X	X											
	9:50	HMOS2395-05	1	X	X											composite HMOS2395-05 and -06 for TPH
	10:00	HMOS2395-06	1	X	X											
	10:15	HMOS2395-07	1	X												
	10:30	HMOS2395-08	1	X	X											composite HMOS2395-08, -09, & -10 for TPH
	10:35	HMOS2395-09	1	X	X											
	10:50	HMOS2395-10	1	X	X											
	11:00	HMOS2395-11	1	X	X											composite HMOS2395-11 & -12 for TPH
	11:10	HMOS2395-12	1	X	X											
	11:20	HMOS2395-13	1	X	X											~~composite w/ HMOS2395-01 for TPH~~
	11:30	HMOS2395-14	1	X	X											composite w/ HMOS2395-02 for TPH
	11:40	HMOS2395-15	1	X												
	11:50	HMOS2395-16	1	X												
	12:00	HMOS2395-17	1	X	X	X										composite HMOS2395-17, -18, -19, and -20 for TPH and ~~Composite~~ radiation
	12:05	HMOS2395-18	1	X	X	X										
	12:10	HMOS2395-19	1	X	X	X										
5/23/95	12:15	HMOS2395-20	1	X	X	X										

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horns	5/24 19:20	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/25 9:00	Daniel Horns
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Daniel Horns	5/25/95 12:30	

Remarks

* See attached sheet for a list of metals

5-day turn around

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

KLEINFELDER

PROJ. NO.	PROJECT NAME: 31-6930 60
L.P. NO. (P.O. NO.)	SAMPLERS: (Signature/Number) Daniel Horns /2362

LAB # 22031

DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.	NO. OF CONTAINERS	ANALYSIS * Metals	TPH/418.1	8+Radiation/9030	REMARKS
5/23/95	12:50	HMOS2395-21	1	X	X		composite HMOS2395-21, -22, -23, and -24 for TPH.
	12:55	HMOS2395-22	1	X	X		
	13:00	HMOS2395-23	1	X	X		
	13:05	HMOS2395-24	1	X	X		
	13:10	HMOS2395-25	1	X	X		
	13:15	HMOS2395-26	1	X			
	13:20	HMOS2395-27	1	X		X	composite with HMOS2395-29 for radiation
	13:25	HMOS2395-28	1	X	X		
	13:40	HMOS2395-29	1	X		X	composite w/ HMOS2395-27 for radiation
	14:00	HMOS2395-30	1	X		X	composite samples HMOS2395-30, 31, -32, and -33 for radiation
	14:05	HMOS2395-31	1	X		X	
	14:05	HMOS2395-32	1	X		X	
	14:10	HMOS2395-33	1	X		X	
	14:15	Field Blank	2	X	X		
	14:35	HMOS2395-34	1	X			
	14:45	HMOS2395-35	1	X			
	14:50	HMOS2395-36	1	X		X	composite HMOS2395-36, -37, -35, and -39 for radiation
	14:55	HMOS2395-37	1	X		X	
	~~14:55~~ 14:55	HMOS2395-38	1	X		X	
5/23/95	15:0~~5~~ 15:10	HMOS2395-39	1	X		X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horns	5/24 14:20	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/25 9:00	Daniel Horns
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Daniel Horns	5/25/95 12:30	Ellen Hoff

Remarks

* See attached sheet for a list of metals

5-day turn around

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

KLEINFELDER

PROJ NO	PROJECT NAME	NO. OF CONTAINERS	ANALYSIS *	LAB # 22631
	31-693060		Metals	36 5
L.P. NO (P.O. NO.)	SAMPLERS: (Signature/Number)			
	Daniel Horne / 2362			

DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.	NO. OF CONTAINERS	ANALYSIS * Metals	REMARKS
5/23/95	15:40	HM05 2395-40	1	X	
	15:40	HM05 2395-41	1	X	
	15:50	HM05 2395-42	1	X	
	16:00	HM05 2395-43	1	X	
	16:30	HM05 2395-44	1	X	
	16:40	HM05 2395-45	1	X	
	16:35	HM05 2395-46	1	X	
	16:45	HM05 2395-47	1	X	
	16:55	HM05 2395-48	1	X	
	17:00	HM05 2395-49	1	X	
5/23/95	17:10	HM05 2395-50	1	X	
5/24/95	7:30	HM05 2495-01	1	X	
	7:35	HM05 2495-02	1	X	
	7:40	HM05 2495-03	1	X	
	7:45	HM05 2495-04	1	X	
	7:50	HM05 2495-05	1	X	
	7:55	HM05 2495-06	1	X	
	8:00	HM05 2495-07	1	X	
	8:15	HM05 2495-08	1	X	
5/24/95	8:20	HM05 2495-09	1	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horne	5/24 17:20	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/25 9:00	Daniel Horne
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Daniel Horne	5/25/95 12:30	

Remarks

* see attached sheet for a list of metals

5-day turn around

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

KLEINFELDER

PROJ NO	PROJECT NAME	NO. OF CONTAINERS	ANALYSIS * Metals	LAB # 22631
	31-693060			5 6 5
LP NO (P.O. NO.)	SAMPLERS: (Signature/Number) Daniel Horns/2362			4 REMARKS

DATE MM DD YY	SAMPLE I.D. TIME HH:MM:SS	SAMPLE I.D.	NO. OF CONTAINERS	ANALYSIS * Metals
5/24/95	8:30	HM052495-10	1	X
	8:42	HM052495-11	1	X
	8:45	HM052495-12	1	X
	8:50	HM052495-13	1	X
	9:00	HM052495-14	1	X
	9:05	HM052495-15	1	X
	9:10	HM052495-16	1	X
	9:15	HM052495-17	1	X
	9:20	HM052495-18	1	X
	9:30	HM052495-19	1	X
	9:35	HM052495-20	1	X
	9:45	HM052495-21	1	X
	9:50	HM052495-22	1	X
	9:54	HM052495-23	1	X
	10:00	HM052495-24	1	X
	10:05	HM052495-25	1	X
	10:15	HM052495-26	1	X
	10:20	HM052495-27	1	X
	10:40	HM052495-28	1	X
5/24/95	11:00	HM052495-29	1	X

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horns	5/24 19:20	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/ 9:00	Daniel Horns
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Daniel Horns	5/25/95 12:30	

Remarks

* see attached sheet for a list of metals

5-day turn around

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

KLEINFELDER

PROJ NO	PROJECT NAME	NO. OF CONTAINERS	ANALYSIS * Metals	REMARKS
	31-693060			5 / 4 6 5 / LAB # 22631
L.P. NO (P.O. NO.)	SAMPLERS: (Signature/Number) Daniel Horus /2362			

DATE MM DD YY	SAMPLE I.D. TIME HH:MM:SS	SAMPLE I.D.	NO. OF CONTAINERS	ANALYSIS * Metals	REMARKS
5/24/95	11:05	HMOS2495-30	1	X	
	11:10	HMOS2495-31	1	X	
	11:15	HMOS2495-32	1	X	
	11:25	HMOS2495-33	1	X	
	11:30	HMOS2495-34	1	X	
	11:50	HMOS2495-35	1	X	
	11:55	HMOS2495-36	1	X	
5/24/95	12:05	HMOS2495-37	1	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horus	5/24 19:10	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/25 9:00	Daniel Horus
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
Daniel Horus	5/29/95 12:30	

Remarks

* See attached sheet for a list of metals

5-day turn around

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

CUSTODY

№ 455

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-01

Lab Sample ID:
L22631-1

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	**360.**

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: John Yamagata
Laboratory Supervisor

Report Date: May 30,1995

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-13

Lab Sample ID:
L22631-13

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	25.

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: John Yamagata
Laboratory Supervisor

Report Date: May 30,1995

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-25

Lab Sample ID:
L22631-25

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	**9.0**

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: John Yarnyte
Laboratory Supervisor

Report Date: May 30,1995

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-28

Lab Sample ID:
L22631-28

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	**54.**

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: _____
Laboratory Supervisor

Report Date: May 30,1995

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Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-02/HM052395-14 COMP

Lab Sample ID:
L22631-88

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	100.	**580.**

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: _____
Laboratory Supervisor

Report Date: May 30,1995

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Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-03/HM052395-04 COMP

Lab Sample ID:
L22631-89

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	< 5.0

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: John Yarnall
Laboratory Supervisor

Report Date: May 30,1995

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84115

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Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-05/HM052395-06 COMP

Lab Sample ID:
L22631-90

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	10.	**110.**

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: _____
Laboratory Supervisor

Report Date: May 30,1995

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Salt Lake City, Utah
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Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-08,09,&10 COMP

Lab Sample ID:
L22631-91

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	20.

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: _____
Laboratory Supervisor

Report Date: May 30,1995

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

163 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-11 & 12 COMP

Lab Sample ID:
L22631-92

Analytical Results — **Total Recoverable Petroleum Hydrocarbons**
Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	33.

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: _____
Laboratory Supervisor

Report Date: May 30,1995

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Salt Lake City, Utah
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Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-17,18,19, & 20 COMP

Lab Sample ID:
L22631-93

Analytical Results — Total Recoverable Petroleum Hydrocarbons

Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	35.

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: John Yamagata
Laboratory Supervisor

Report Date: May 30,1995

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Salt Lake City, Utah
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Client: Kleinfelder
Date Sampled: May 23,1995
Date Received: May 25,1995

Contact: Daniel Horns
Date Extracted: May 26,1995
Date Analyzed: May 26,1995

Analysis Requested:
Total Recoverable Petroleum Hydrocarbons

Method Ref.Number:
EPA 418.1 (Extraction Infared Absorption)

Field Sample ID:
31-6930 60
HM052395-21,22,23, & 24 COMP

Lab Sample ID:
L22631-94

Analytical Results — **Total Recoverable Petroleum Hydrocarbons**
Units= mg/kg(ppm)

Compound:	Detection Limit:	Amount Detected:
Total Recoverable Petroleum Hydrocarbons	5.0	15.

< Value = None detected above the specified detection limit, or a value that reflects a reasonable limit due to interferences.

Released By: _____
Laboratory Supervisor

Report Date: May 30,1995

QUALITY CONTROL REPORT

Client: Kleinfelder
Lab Sample ID.: 22631
Set Description: Ninety Solid Samples

Contact: Daniel Horns
Received By: Elona Hayward

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
22631-94	Oil & Grease	4.9	1,150.	1,152.	1,140.	99.7	98.7	1.0

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Report Date 6/1/95

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AMERICAN WEST ANALYTICAL LABORATORIES

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84115

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-01
Field Sample ID.: HM052395-01/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**92**
Barium	6010	0.5	**66**
Cadmium	6010	0.2	**7.2**
Chromium	6010	0.5	**9.1**
Cobalt	6010	0.5	**260**
Copper	6010	0.5	**260**
Lead	6010	3.0	**170**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**28**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.7**
Zinc	6010	0.5	**250**

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84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-02
Field Sample ID.: HM052395-02/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	230
Barium	6010	0.5	150
Cadmium	6010	0.2	14
Chromium	6010	0.5	11
Cobalt	6010	0.5	120
Copper	6010	0.5	570
Lead	6010	3.0	240
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	55
Selenium	7740	0.1	<0.1
Silver	6010	0.5	15
Zinc	6010	0.5	530

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-03
Field Sample ID.: HM052395-03/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2.6**
Barium	6010	0.5	**76**
Cadmium	6010	0.2	**0.2**
Chromium	6010	0.5	**7.8**
Cobalt	6010	0.5	**4.4**
Copper	6010	0.5	**7.1**
Lead	6010	3.0	**7.2**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**7.1**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.5**
Zinc	6010	0.5	**18**

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Report Date 6/1/95

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Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-04
Field Sample ID.: HM052395-04/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.7
Barium	6010	0.5	86
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	8.4
Cobalt	6010	0.5	5.7
Copper	6010	0.5	7.5
Lead	6010	3.0	8.2
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7.6
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.7
Zinc	6010	0.5	19

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AMERICAN WEST ANALYTICAL LABORATORIES

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-05
Field Sample ID.: HM052395-05/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**190**
Barium	6010	0.5	**140**
Cadmium	6010	0.2	**42**
Chromium	6010	0.5	**6.6**
Cobalt	6010	0.5	**80**
Copper	6010	0.5	**600**
Lead	6010	3.0	**380**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**32**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**3.1**
Zinc	6010	0.5	**590**

Released by: _____
Laboratory Supervisor

Report Date 6/1/95

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463 West 3600 South
Salt Lake City, Utah
84115
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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-06
Field Sample ID.: HM052395-06/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**100**
Barium	6010	0.5	**210**
Cadmium	6010	0.2	**9.5**
Chromium	6010	0.5	**11**
Cobalt	6010	0.5	**59**
Copper	6010	0.5	**340**
Lead	6010	3.0	**280**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**22**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**2.7**
Zinc	6010	0.5	**660**

Released by: _____
Laboratory Supervisor

Report Date 6/1/95

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84115

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-07
Field Sample ID.: HM052395-07/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.2
Barium	6010	0.5	63
Cadmium	6010	0.2	0.2
Chromium	6010	0.5	8.6
Cobalt	6010	0.5	4.2
Copper	6010	0.5	16
Lead	6010	3.0	5
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.1
Zinc	6010	0.5	22

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Salt Lake City, Utah
84115

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-08
Field Sample ID.: HM052395-08/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**410**
Barium	6010	0.5	**85**
Cadmium	6010	0.2	**6**
Chromium	6010	0.5	**9.6**
Cobalt	6010	0.5	**46**
Copper	6010	0.5	**630**
Lead	6010	3.0	**480**
Mercury	7471	0.1	**0.2**
Nickel	6010	0.5	**18**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**3.3**
Zinc	6010	0.5	**430**

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Laboratory Supervisor

Report Date 6/1/95

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-09
Field Sample ID.: HM052395-09/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**40**
Barium	6010	0.5	**150**
Cadmium	6010	0.2	**1.1**
Chromium	6010	0.5	**8.7**
Cobalt	6010	0.5	**14**
Copper	6010	0.5	**70**
Lead	6010	3.0	**81**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**11**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.7**
Zinc	6010	0.5	**76**

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Laboratory Supervisor

Report Date 6/1/95

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Salt Lake City, Utah
84115

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-10
Field Sample ID.: HM052395-10/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	21
Barium	6010	0.5	78
Cadmium	6010	0.2	1.1
Chromium	6010	0.5	5.3
Cobalt	6010	0.5	5.4
Copper	6010	0.5	53
Lead	6010	3.0	50
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7.4
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	49

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Laboratory Supervisor

Report Date 6/2/95

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AMERICAN WEST ANALYTICAL LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-11
Field Sample ID.: HM052395-11/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**200**
Barium	6010	0.5	**73**
Cadmium	6010	0.2	**75**
Chromium	6010	0.5	**8.2**
Cobalt	6010	0.5	**72**
Copper	6010	0.5	**430**
Lead	6010	3.0	**410**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**21**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**5.1**
Zinc	6010	0.5	**680**

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Laboratory Supervisor

Report Date 6/1/95

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-12
Field Sample ID.: HM052395-12/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**240**
Barium	6010	0.5	**90**
Cadmium	6010	0.2	**8.8**
Chromium	6010	0.5	**12**
Cobalt	6010	0.5	**57**
Copper	6010	0.5	**450**
Lead	6010	3.0	**400**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**21**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**3.3**
Zinc	6010	0.5	**580**

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Laboratory Supervisor

Report Date 6/1/95

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-13
Field Sample ID.: HM052395-13/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	510
Barium	6010	0.5	120
Cadmium	6010	0.2	7.7
Chromium	6010	0.5	10
Cobalt	6010	0.5	20
Copper	6010	0.5	4300
Lead	6010	3.0	980
Mercury	7471	0.1	0.1
Nickel	6010	0.5	22
Selenium	7740	0.1	2
Silver	6010	0.5	4.5
Zinc	6010	0.5	1000

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-14
Field Sample ID.: HM052395-14/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**1200**
Barium	6010	0.5	**310**
Cadmium	6010	0.2	**35**
Chromium	6010	0.5	**16**
Cobalt	6010	0.5	**280**
Copper	6010	0.5	**4400**
Lead	6010	3.0	**2500**
Mercury	7471	0.1	**0.4**
Nickel	6010	0.5	**110**
Selenium	7740	0.1	**1.5**
Silver	6010	0.5	**9.5**
Zinc	6010	0.5	**4900**

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-15
Field Sample ID.: HM052395-15/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**930**
Barium	6010	0.5	**250**
Cadmium	6010	0.2	**30**
Chromium	6010	0.5	**15**
Cobalt	6010	0.5	**250**
Copper	6010	0.5	**2700**
Lead	6010	3.0	**2300**
Mercury	7471	0.1	**0.4**
Nickel	6010	0.5	**88**
Selenium	7740	0.1	**2**
Silver	6010	0.5	**10**
Zinc	6010	0.5	**4400**

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AMERICAN WEST ANALYTICAL LABORATORIES

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84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-16
Field Sample ID.: HM052395-16/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2.6**
Barium	6010	0.5	**79**
Cadmium	6010	0.2	**0.3**
Chromium	6010	0.5	**7.3**
Cobalt	6010	0.5	**4.1**
Copper	6010	0.5	**11**
Lead	6010	3.0	**9.1**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**6.6**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.6**
Zinc	6010	0.5	**18**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-17
Field Sample ID.: HM052395-17/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**8.8**
Barium	6010	0.5	**35**
Cadmium	6010	0.2	**1.5**
Chromium	6010	0.5	**6.7**
Cobalt	6010	0.5	**40**
Copper	6010	0.5	**7.9**
Lead	6010	3.0	**23**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**10**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.7**
Zinc	6010	0.5	**15**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-18
Field Sample ID.: HM052395-18/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**10**
Barium	6010	0.5	**29**
Cadmium	6010	0.2	**1.4**
Chromium	6010	0.5	**5.9**
Cobalt	6010	0.5	**91**
Copper	6010	0.5	**23**
Lead	6010	3.0	**26**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**9**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**<0.5**
Zinc	6010	0.5	**26**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-19
Field Sample ID.: HM052395-19/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3600**
Barium	6010	0.5	**270**
Cadmium	6010	0.2	**46**
Chromium	6010	0.5	**41**
Cobalt	6010	0.5	**1500**
Copper	6010	0.5	**8700**
Lead	6010	3.0	**8900**
Mercury	7471	0.1	**1.6**
Nickel	6010	0.5	**150**
Selenium	7740	0.1	**3.2**
Silver	6010	0.5	**33**
Zinc	6010	0.5	**9100**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-20
Field Sample ID.: HM052395-20/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5000
Barium	6010	0.5	620
Cadmium	6010	0.2	640
Chromium	6010	0.5	21
Cobalt	6010	0.5	420
Copper	6010	0.5	28000
Lead	6010	3.0	13000
Mercury	7471	0.1	2.3
Nickel	6010	0.5	260
Selenium	7740	0.1	5.3
Silver	6010	0.5	36
Zinc	6010	0.5	16000

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-21
Field Sample ID.: HM052395-21/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**71**
Barium	6010	0.5	**91**
Cadmium	6010	0.2	**3.6**
Chromium	6010	0.5	**11**
Cobalt	6010	0.5	**300**
Copper	6010	0.5	**91**
Lead	6010	3.0	**160**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**17**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.8**
Zinc	6010	0.5	**120**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-22
Field Sample ID.: HM052395-22/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**7000**
Barium	6010	0.5	**300**
Cadmium	6010	0.2	**110**
Chromium	6010	0.5	**30**
Cobalt	6010	0.5	**690**
Copper	6010	0.5	**12000**
Lead	6010	3.0	**20000**
Mercury	7471	0.1	**0.6**
Nickel	6010	0.5	**220**
Selenium	7740	0.1	**6.4**
Silver	6010	0.5	**40**
Zinc	6010	0.5	**11000**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-23
Field Sample ID.: HM052395-23/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**80**
Barium	6010	0.5	**89**
Cadmium	6010	0.2	**4**
Chromium	6010	0.5	**11**
Cobalt	6010	0.5	**100**
Copper	6010	0.5	**87**
Lead	6010	3.0	**110**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**20**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.2**
Zinc	6010	0.5	**97**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-24
Field Sample ID.: HM052395-24/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2700**
Barium	6010	0.5	**230**
Cadmium	6010	0.2	**43**
Chromium	6010	0.5	**15**
Cobalt	6010	0.5	**180**
Copper	6010	0.5	**8600**
Lead	6010	3.0	**9900**
Mercury	7471	0.1	**0.2**
Nickel	6010	0.5	**100**
Selenium	7740	0.1	**2.8**
Silver	6010	0.5	**25**
Zinc	6010	0.5	**8900**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-25
Field Sample ID.: HM052395-25/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**36**
Barium	6010	0.5	**66**
Cadmium	6010	0.2	**1.3**
Chromium	6010	0.5	**9.8**
Cobalt	6010	0.5	**100**
Copper	6010	0.5	**74**
Lead	6010	3.0	**89**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**16**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.7**
Zinc	6010	0.5	**82**

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Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-26
Field Sample ID.: HM052395-26/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**10**
Barium	6010	0.5	**68**
Cadmium	6010	0.2	**0.6**
Chromium	6010	0.5	**10**
Cobalt	6010	0.5	**85**
Copper	6010	0.5	**40**
Lead	6010	3.0	**33**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**13**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1**
Zinc	6010	0.5	**63**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-27
Field Sample ID.: HM052395-27/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**180**
Barium	6010	0.5	**94**
Cadmium	6010	0.2	**17**
Chromium	6010	0.5	**17**
Cobalt	6010	0.5	**290**
Copper	6010	0.5	**150**
Lead	6010	3.0	**250**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**36**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.8**
Zinc	6010	0.5	**200**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-28
Field Sample ID.: HM052395-28/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**58**
Barium	6010	0.5	**22**
Cadmium	6010	0.2	**1.6**
Chromium	6010	0.5	**9.3**
Cobalt	6010	0.5	**87**
Copper	6010	0.5	**160**
Lead	6010	3.0	**47**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**14**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.8**
Zinc	6010	0.5	**160**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-29
Field Sample ID.: HM052395-29/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**200**
Barium	6010	0.5	**110**
Cadmium	6010	0.2	**19**
Chromium	6010	0.5	**21**
Cobalt	6010	0.5	**900**
Copper	6010	0.5	**430**
Lead	6010	3.0	**370**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**79**
Selenium	7740	0.1	**0.2**
Silver	6010	0.5	**4.7**
Zinc	6010	0.5	**410**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-30
Field Sample ID.: HM052395-30/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**110**
Barium	6010	0.5	**44**
Cadmium	6010	0.2	**7.8**
Chromium	6010	0.5	**25**
Cobalt	6010	0.5	**1100**
Copper	6010	0.5	**160**
Lead	6010	3.0	**170**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**110**
Selenium	7740	0.1	**0.3**
Silver	6010	0.5	**3.9**
Zinc	6010	0.5	**300**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-31
Field Sample ID.: HM052395-31/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**1400**
Barium	6010	0.5	**210**
Cadmium	6010	0.2	**15**
Chromium	6010	0.5	**13**
Cobalt	6010	0.5	**190**
Copper	6010	0.5	**2200**
Lead	6010	3.0	**2500**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**69**
Selenium	7740	0.1	**1.9**
Silver	6010	0.5	**8.8**
Zinc	6010	0.5	**2000**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-32
Field Sample ID.: HM052395-32/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3500**
Barium	6010	0.5	**550**
Cadmium	6010	0.2	**80**
Chromium	6010	0.5	**21**
Cobalt	6010	0.5	**220**
Copper	6010	0.5	**9700**
Lead	6010	3.0	**10000**
Mercury	7471	0.1	**0.2**
Nickel	6010	0.5	**170**
Selenium	7740	0.1	**1.5**
Silver	6010	0.5	**28**
Zinc	6010	0.5	**16000**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-33
Field Sample ID.: HM052395-33/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2500**
Barium	6010	0.5	**390**
Cadmium	6010	0.2	**47**
Chromium	6010	0.5	**15**
Cobalt	6010	0.5	**210**
Copper	6010	0.5	**8200**
Lead	6010	3.0	**6400**
Mercury	7471	0.1	**0.2**
Nickel	6010	0.5	**110**
Selenium	7740	0.1	**7**
Silver	6010	0.5	**21**
Zinc	6010	0.5	**7200**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-34
Field Sample ID.: HM052395-34/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.2
Barium	6010	0.5	32
Cadmium	6010	0.2	1
Chromium	6010	0.5	7.5
Cobalt	6010	0.5	3.5
Copper	6010	0.5	5
Lead	6010	3.0	12
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7.1
Selenium	7740	0.1	0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	11

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-35
Field Sample ID.: HM052395-35/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.5
Barium	6010	0.5	30
Cadmium	6010	0.2	1.1
Chromium	6010	0.5	6.4
Cobalt	6010	0.5	3.2
Copper	6010	0.5	3.4
Lead	6010	3.0	9.6
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	9

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Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-36
Field Sample ID.: HM052395-36/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.2
Barium	6010	0.5	33
Cadmium	6010	0.2	1
Chromium	6010	0.5	6.9
Cobalt	6010	0.5	3.3
Copper	6010	0.5	4.6
Lead	6010	3.0	9.4
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7.3
Selenium	7740	0.1	<.01
Silver	6010	0.5	<0.5
Zinc	6010	0.5	12

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-37
Field Sample ID.: HM052395-37/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**61**
Barium	6010	0.5	**140**
Cadmium	6010	0.2	**1.5**
Chromium	6010	0.5	**16**
Cobalt	6010	0.5	**12**
Copper	6010	0.5	**130**
Lead	6010	3.0	**120**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**18**
Selenium	7740	0.1	**0.2**
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**270**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-38
Field Sample ID.: HM052395-38/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**24**
Barium	6010	0.5	**100**
Cadmium	6010	0.2	**0.2**
Chromium	6010	0.5	**13**
Cobalt	6010	0.5	**8**
Copper	6010	0.5	**47**
Lead	6010	3.0	**62**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**12**
Selenium	7740	0.1	**0.1**
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**60**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-39
Field Sample ID.: HM052395-39/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**28**
Barium	6010	0.5	**110**
Cadmium	6010	0.2	**0.5**
Chromium	6010	0.5	**13**
Cobalt	6010	0.5	**7.7**
Copper	6010	0.5	**58**
Lead	6010	3.0	**48**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**12**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**100**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-40
Field Sample ID.: HM052395-40/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**0.6**
Barium	6010	0.5	**140**
Cadmium	6010	0.2	**0.3**
Chromium	6010	0.5	**14**
Cobalt	6010	0.5	**7.1**
Copper	6010	0.5	**15**
Lead	6010	3.0	**7.1**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**13**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**40**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-41
Field Sample ID.: HM052395-41/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	<0.5
Barium	6010	0.5	150
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	16
Cobalt	6010	0.5	8
Copper	6010	0.5	26
Lead	6010	3.0	20
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	14
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	54

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-42
Field Sample ID.: HM052395-42/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**1.1**
Barium	6010	0.5	**120**
Cadmium	6010	0.2	**0.3**
Chromium	6010	0.5	**14**
Cobalt	6010	0.5	**6.8**
Copper	6010	0.5	**14**
Lead	6010	3.0	**4.6**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**12**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**39**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-43
Field Sample ID.: HM052395-43/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.5
Barium	6010	0.5	66
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	6
Cobalt	6010	0.5	3.7
Copper	6010	0.5	16
Lead	6010	3.0	5.3
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	5.4
Selenium	7740	0.1	<0.1
Silver	6010	0.5	0.9
Zinc	6010	0.5	13

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-44
Field Sample ID.: HM052395-44/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**8**
Barium	6010	0.5	**89**
Cadmium	6010	0.2	**0.8**
Chromium	6010	0.5	**13**
Cobalt	6010	0.5	**22**
Copper	6010	0.5	**11**
Lead	6010	3.0	**6.1**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**23**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**910**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-45
Field Sample ID.: HM052395-45/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**140**
Barium	6010	0.5	**33**
Cadmium	6010	0.2	**10**
Chromium	6010	0.5	**190**
Cobalt	6010	0.5	**69**
Copper	6010	0.5	**40**
Lead	6010	3.0	**9.5**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**86**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.5**
Zinc	6010	0.5	**6400**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-46
Field Sample ID.: HM052395-46/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	65
Barium	6010	0.5	23
Cadmium	6010	0.2	7.5
Chromium	6010	0.5	160
Cobalt	6010	0.5	53
Copper	6010	0.5	26
Lead	6010	3.0	9.1
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	64
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	4200

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-47
Field Sample ID.: HM052395-47/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.2
Barium	6010	0.5	81
Cadmium	6010	0.2	2.3
Chromium	6010	0.5	8.3
Cobalt	6010	0.5	58
Copper	6010	0.5	18
Lead	6010	3.0	9.9
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	49
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	4400

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-48
Field Sample ID.: HM052395-48/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**62**
Barium	6010	0.5	**110**
Cadmium	6010	0.2	**2.3**
Chromium	6010	0.5	**31**
Cobalt	6010	0.5	**53**
Copper	6010	0.5	**25**
Lead	6010	3.0	**9.3**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**48**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**1900**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-49
Field Sample ID.: HM052395-49/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2
Barium	6010	0.5	110
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	12
Cobalt	6010	0.5	6.5
Copper	6010	0.5	12
Lead	6010	3.0	6.6
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	11
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	31

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-50
Field Sample ID.: HM052395-50/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.4
Barium	6010	0.5	100
Cadmium	6010	0.2	0.5
Chromium	6010	0.5	11
Cobalt	6010	0.5	6
Copper	6010	0.5	10
Lead	6010	3.0	6.9
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	10
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	25

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-51
Field Sample ID.: HM052495-01/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5
Barium	6010	0.5	93
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	11
Cobalt	6010	0.5	7.5
Copper	6010	0.5	14
Lead	6010	3.0	17
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	11
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	42

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-52
Field Sample ID.: HM052495-02/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**1.6**
Barium	6010	0.5	**180**
Cadmium	6010	0.2	**0.3**
Chromium	6010	0.5	**8.8**
Cobalt	6010	0.5	**5.3**
Copper	6010	0.5	**16**
Lead	6010	3.0	**3.4**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**8.9**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**23**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-53
Field Sample ID.: HM052495-03/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3.1**
Barium	6010	0.5	**85**
Cadmium	6010	0.2	**1**
Chromium	6010	0.5	**5.8**
Cobalt	6010	0.5	**3.7**
Copper	6010	0.5	**15**
Lead	6010	3.0	**9.7**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**7.6**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**9**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-54
Field Sample ID.: HM052495-04/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**15**
Barium	6010	0.5	**67**
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	**7.2**
Cobalt	6010	0.5	**4.7**
Copper	6010	0.5	**48**
Lead	6010	3.0	**34**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**6.9**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**26**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-55
Field Sample ID.: HM052495-05/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3.2**
Barium	6010	0.5	**63**
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	**6.1**
Cobalt	6010	0.5	**3.1**
Copper	6010	0.5	**41**
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**4.9**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**16**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-56
Field Sample ID.: HM052495-06/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**5**
Barium	6010	0.5	**160**
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	**8.2**
Cobalt	6010	0.5	**8**
Copper	6010	0.5	**22**
Lead	6010	3.0	**19**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**8.9**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**22**

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AMERICAN WEST ANALYTICAL LABORATORIES

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(801) 263-8686
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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-57
Field Sample ID.: HM052495-07/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**0.8**
Barium	6010	0.5	**260**
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	**3.7**
Cobalt	6010	0.5	**1.5**
Copper	6010	0.5	**18**
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**2.6**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**6.9**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-58
Field Sample ID.: HM052495-08/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**4.8**
Barium	6010	0.5	**99**
Cadmium	6010	0.2	**2.1**
Chromium	6010	0.5	**13**
Cobalt	6010	0.5	**20**
Copper	6010	0.5	**10**
Lead	6010	3.0	**6.2**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**23**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**640**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-59
Field Sample ID.: HM052495-09/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	8.4
Barium	6010	0.5	93
Cadmium	6010	0.2	0.8
Chromium	6010	0.5	14
Cobalt	6010	0.5	21
Copper	6010	0.5	9.3
Lead	6010	3.0	5.5
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	25
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	570

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-60
Field Sample ID.: HM052495-10/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2500**
Barium	6010	0.5	**60**
Cadmium	6010	0.2	**14**
Chromium	6010	0.5	**380**
Cobalt	6010	0.5	**37**
Copper	6010	0.5	**87**
Lead	6010	3.0	**20**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**54**
Selenium	7740	0.1	**0.1**
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**2500**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-61
Field Sample ID.: HM052495-11/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**79**
Barium	6010	0.5	**67**
Cadmium	6010	0.2	**2.1**
Chromium	6010	0.5	**24**
Cobalt	6010	0.5	**36**
Copper	6010	0.5	**9.5**
Lead	6010	3.0	**8**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**37**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**1300**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-62
Field Sample ID.: HM052495-12/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**49**
Barium	6010	0.5	**67**
Cadmium	6010	0.2	**2.3**
Chromium	6010	0.5	**19**
Cobalt	6010	0.5	**67**
Copper	6010	0.5	**15**
Lead	6010	3.0	**8.7**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**52**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**2200**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-63
Field Sample ID.: HM052495-13/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2.6**
Barium	6010	0.5	**74**
Cadmium	6010	0.2	**0.7**
Chromium	6010	0.5	**5.3**
Cobalt	6010	0.5	**3**
Copper	6010	0.5	**3.1**
Lead	6010	3.0	**5.6**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**5.4**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**15**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-64
Field Sample ID.: HM052495-14/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**7.1**
Barium	6010	0.5	**84**
Cadmium	6010	0.2	**0.9**
Chromium	6010	0.5	**10**
Cobalt	6010	0.5	**14**
Copper	6010	0.5	**8.7**
Lead	6010	3.0	**6.7**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**24**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**140**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-65
Field Sample ID.: HM052495-15/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.8
Barium	6010	0.5	44
Cadmium	6010	0.2	3.4
Chromium	6010	0.5	5.2
Cobalt	6010	0.5	22
Copper	6010	0.5	2.8
Lead	6010	3.0	9.3
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	16
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	1400

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-66
Field Sample ID.: HM052495-16/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3.6**
Barium	6010	0.5	**67**
Cadmium	6010	0.2	**0.8**
Chromium	6010	0.5	**4.5**
Cobalt	6010	0.5	**3.5**
Copper	6010	0.5	**2.2**
Lead	6010	3.0	**6.6**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**5.5**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**59**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-67
Field Sample ID.: HM052495-17/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**7.2**
Barium	6010	0.5	**75**
Cadmium	6010	0.2	**1**
Chromium	6010	0.5	**6.1**
Cobalt	6010	0.5	**6.1**
Copper	6010	0.5	**4.2**
Lead	6010	3.0	**9.7**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**8.1**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**150**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-68
Field Sample ID.: HM052495-18/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.7
Barium	6010	0.5	94
Cadmium	6010	0.2	0.7
Chromium	6010	0.5	10
Cobalt	6010	0.5	5.3
Copper	6010	0.5	6.8
Lead	6010	3.0	5.5
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	10
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	25

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-69
Field Sample ID.: HM052495-19/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**890**
Barium	6010	0.5	**40**
Cadmium	6010	0.2	**50**
Chromium	6010	0.5	**5.9**
Cobalt	6010	0.5	**6.4**
Copper	6010	0.5	**640**
Lead	6010	3.0	**20**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**11**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**6300**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-70
Field Sample ID.: HM052495-20/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**91**
Barium	6010	0.5	**28**
Cadmium	6010	0.2	**5.6**
Chromium	6010	0.5	**5.7**
Cobalt	6010	0.5	**3.5**
Copper	6010	0.5	**83**
Lead	6010	3.0	**9.2**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**6.6**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**250**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-71
Field Sample ID.: HM052495-21/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**5.3**
Barium	6010	0.5	**89**
Cadmium	6010	0.2	**0.9**
Chromium	6010	0.5	**11**
Cobalt	6010	0.5	**4.1**
Copper	6010	0.5	**7.9**
Lead	6010	3.0	**9.1**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**7.7**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1**
Zinc	6010	0.5	**26**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-72
Field Sample ID.: HM052495-22/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**4.3**
Barium	6010	0.5	**17**
Cadmium	6010	0.2	**0.9**
Chromium	6010	0.5	**4.5**
Cobalt	6010	0.5	**2.5**
Copper	6010	0.5	**1.7**
Lead	6010	3.0	**7.4**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**5.6**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**4.7**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-73
Field Sample ID.: HM052495-23/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**21**
Barium	6010	0.5	**80**
Cadmium	6010	0.2	**1**
Chromium	6010	0.5	**11**
Cobalt	6010	0.5	**5.1**
Copper	6010	0.5	**17**
Lead	6010	3.0	**6.9**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**8.8**
Selenium	7740	0.1	**0.3**
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**54**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-74
Field Sample ID.: HM052495-24/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**17**
Barium	6010	0.5	**19**
Cadmium	6010	0.2	**1.2**
Chromium	6010	0.5	**4.5**
Cobalt	6010	0.5	**3.5**
Copper	6010	0.5	**10**
Lead	6010	3.0	**11**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**5.5**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**11**

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-75
Field Sample ID.: HM052495-25/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	33
Barium	6010	0.5	24
Cadmium	6010	0.2	1.5
Chromium	6010	0.5	5.2
Cobalt	6010	0.5	3.4
Copper	6010	0.5	19
Lead	6010	3.0	12
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	5.3
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	22

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-76
Field Sample ID.: HM052495-26/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.2
Barium	6010	0.5	52
Cadmium	6010	0.2	1
Chromium	6010	0.5	5.8
Cobalt	6010	0.5	3.2
Copper	6010	0.5	3
Lead	6010	3.0	8
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	6.8
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	12

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Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-77
Field Sample ID.: HM052495-27/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3
Barium	6010	0.5	32
Cadmium	6010	0.2	1.1
Chromium	6010	0.5	5.6
Cobalt	6010	0.5	3
Copper	6010	0.5	2.7
Lead	6010	3.0	8.9
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7
Selenium	7740	0.1	0.3
Silver	6010	0.5	<0.5
Zinc	6010	0.5	6.3

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Report Date 6/1/95

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-78
Field Sample ID.: HM052495-28/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**22**
Barium	6010	0.5	**100**
Cadmium	6010	0.2	**0.5**
Chromium	6010	0.5	**12**
Cobalt	6010	0.5	**6.5**
Copper	6010	0.5	**19**
Lead	6010	3.0	**25**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**9.1**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**40**

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-79
Field Sample ID.: HM052495-29/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.6
Barium	6010	0.5	25
Cadmium	6010	0.2	1.1
Chromium	6010	0.5	5.8
Cobalt	6010	0.5	3.2
Copper	6010	0.5	3.4
Lead	6010	3.0	11
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	6.7
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	8.1

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-80
Field Sample ID.: HM052495-30/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	44
Barium	6010	0.5	36
Cadmium	6010	0.2	1.5
Chromium	6010	0.5	5.9
Cobalt	6010	0.5	4.1
Copper	6010	0.5	37
Lead	6010	3.0	53
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	7.3
Selenium	7740	0.1	0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	53

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-81
Field Sample ID.: HM052495-31/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**660**
Barium	6010	0.5	**39**
Cadmium	6010	0.2	**7.5**
Chromium	6010	0.5	**7.8**
Cobalt	6010	0.5	**11**
Copper	6010	0.5	**180**
Lead	6010	3.0	**84**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**12**
Selenium	7740	0.1	**0.2**
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**690**

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-82
Field Sample ID.: HM052495-32/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**1.9**
Barium	6010	0.5	**67**
Cadmium	6010	0.2	**0.2**
Chromium	6010	0.5	**5.4**
Cobalt	6010	0.5	**3.4**
Copper	6010	0.5	**6.2**
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**5.8**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**15**

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Report Date 6/1/95

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-83
Field Sample ID.: HM052495-33/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**24**
Barium	6010	0.5	**110**
Cadmium	6010	0.2	**0.5**
Chromium	6010	0.5	**9.2**
Cobalt	6010	0.5	**10**
Copper	6010	0.5	**44**
Lead	6010	3.0	**45**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**9.9**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	**77**

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-84
Field Sample ID.: HM052495-34/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	27
Barium	6010	0.5	110
Cadmium	6010	0.2	0.6
Chromium	6010	0.5	11
Cobalt	6010	0.5	11
Copper	6010	0.5	43
Lead	6010	3.0	53
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	11
Selenium	7740	0.1	0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	68

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-85
Field Sample ID.: HM052495-35/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**5.2**
Barium	6010	0.5	**100**
Cadmium	6010	0.2	**0.3**
Chromium	6010	0.5	**11**
Cobalt	6010	0.5	**5.6**
Copper	6010	0.5	**11**
Lead	6010	3.0	**9.7**
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	**9.8**
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.3**
Zinc	6010	0.5	**25**

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-86
Field Sample ID.: HM052495-36/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.3
Barium	6010	0.5	110
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	11
Cobalt	6010	0.5	5.8
Copper	6010	0.5	12
Lead	6010	3.0	9.4
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	10
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.1
Zinc	6010	0.5	29

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AMERICAN WEST ANALYTICAL LABORATORIES

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631-87
Field Sample ID.: HM052495-37/31-6930 60

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety-Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.7
Barium	6010	0.5	97
Cadmium	6010	0.2	0.5
Chromium	6010	0.5	13
Cobalt	6010	0.5	7.7
Copper	6010	0.5	16
Lead	6010	3.0	5.5
Mercury	7471	0.1	<0.1
Nickel	6010	0.5	14
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5
Zinc	6010	0.5	41

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Report Date 6/1/95

QUALITY CONTROL REPORT

Client: Kleinfelder
Lab Sample ID.: 22631
Set Description: Ninety Solid Samples

Contact: Daniel Horns
Received By: Elona Hayward

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
22631-01	Arsenic	92.	100.	193.	183.	101.0	91.0	5.3
22631-01	Barium	66.	55.	121.	122.	100.0	101.8	-0.8
22631-01	Cadmium	7.2	55.	56.1	56.6	88.9	89.8	-0.9
22631-01	Chromium	9.1	55.	59.3	59.8	91.3	92.2	-0.8
22631-01	Lead	166.	55.	215.	215.	89.1	89.1	0.0
22631-01	Mercury	0.0	0.6	0.697	0.677	116.2	112.8	2.9
22631-01	Selenium	0.0	50.	37.6	38.5	75.2	77.0	-2.4
22631-01	Silver	0.7	55.	60.6	58.7	108.9	105.5	3.2
22631-01	Cobalt	258.	55.	307.	307.	89.1	89.1	0.0
22631-01	Copper	264.	55.	320.	321.	101.8	103.6	-0.3
22631-01	Nickel	28.	55.	76.6	76.9	88.4	88.9	-0.4
22631-01	Zinc	248.	55.	301.	302.	96.4	98.2	-0.3

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Report Date 6/1/95

QUALITY CONTROL REPORT

Client: Kleinfelder
Lab Sample ID.: 22631
Set Description: Ninety Solid Samples

Contact: Daniel Horns
Received By: Elona Hayward

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
22631-30	Arsenic	109.	33.5	134.	134.	74.6	74.6	0.0
22631-21	Barium	91.	55.	148.	148.	103.6	103.6	0.0
22631-21	Cadmium	3.6	55.	55.3	54.3	94.0	92.2	1.8
22631-21	Chromium	11.	55.	63.7	62.6	95.8	93.8	1.7
22631-21	Lead	158.	55.	211.	209.	96.4	92.7	1.0
22631-21	Mercury	0.0	0.6	0.536	0.559	89.3	93.2	-4.2
22631-21	Selenium	0.0	50.	43.0	42.6	86.0	85.2	0.9
22631-21	Silver	0.8	55.	56.1	55.3	100.5	99.1	1.4
22631-21	Cobalt	298.	55.	348.	349.	90.9	92.7	-0.3
22631-21	Copper	92.	55.	153.	150.	110.9	105.5	2.0
22631-21	Nickel	17.	55.	68.4	67.5	93.5	91.8	1.3
22631-21	Zinc	119.	55.	176.	174.	103.6	100.0	1.1

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Report Date 6/1/95

QUALITY CONTROL REPORT

Client: Kleinfelder
Lab Sample ID.: 22631
Set Description: Ninety Solid Samples

Contact: Daniel Horns
Received By: Elona Hayward

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
22631-41	Arsenic	0.0	50.	58.8	57.4	117.6	114.8	2.4
22631-41	Barium	152.	55.	208.	210.	101.8	105.5	-1.0
22631-41	Cadmium	0.4	55.	53.6	54.0	96.7	97.5	-0.7
22631-41	Chromium	16.	55.	69.8	70.3	97.8	98.7	-0.7
22631-41	Lead	20.	55.	74.9	74.5	99.8	99.1	0.5
22631-41	Mercury	0.0	2.0	2.38	2.36	119.0	118.0	0.8
22631-41	Selenium	0.0	50.	50.8	52.0	101.6	104.0	-2.3
22631-41	Silver	0.0	55.	63.4	58.7	115.3	106.7	7.7
22631-41	Cobalt	8.0	55.	63.8	62.1	101.5	98.4	2.7
22631-41	Copper	26.	55.	85.5	85.9	108.2	108.9	-0.5
22631-41	Nickel	14.	55.	66.2	66.8	94.9	96.0	-0.9
22631-41	Zinc	54.	55.	110.	110.	101.8	101.8	0.0

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Report Date 6/1/95

QUALITY CONTROL REPORT

Client: Kleinfelder
Lab Sample ID.: 22631
Set Description: Ninety Solid Samples

Contact: Daniel Horns
Received By: Elona Hayward

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
22631-61	Arsenic	79.	33.5	111.	109.	95.5	89.6	1.8
22631-61	Barium	67.	55.	126.	124.	107.3	103.6	1.6
22631-61	Cadmium	2.1	55.	54.2	52.9	94.7	92.4	2.4
22631-61	Chromium	24.	55.	77.8	76.3	97.8	95.1	1.9
22631-61	Lead	8.0	55.	61.1	60.2	96.5	94.9	1.5
22631-61	Mercury	0.0	0.6	0.577	0.571	96.2	95.2	1.0
22631-61	Selenium	0.0	50.	46.2	47.1	92.4	94.2	-1.9
22631-61	Silver	0.0	55.	58.9	54.5	107.1	99.1	7.8
22631-61	Cobalt	36.	55.	88.0	86.6	94.5	92.0	1.6
22631-61	Copper	9.5	55.	69.9	68.2	109.8	106.7	2.5
22631-61	Nickel	37.2	55.	88.9	87.4	94.0	91.3	1.7
22631-61	Zinc	1,319.	55.	1,375.	1,368.	101.8	89.1	0.5

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Report Date 6/1/95

QUALITY CONTROL REPORT

Client: Kleinfelder
Lab Sample ID.: 22631
Set Description: Ninety Solid Samples

Contact: Daniel Horns
Received By: Elona Hayward

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
22631-81	Arsenic	660.	335.	923.	941.	78.5	83.9	-1.9
22631-81	Barium	39.	55.	98.8	97.4	108.7	106.2	1.4
22631-81	Cadmium	7.5	55.	61.0	59.7	97.3	94.9	2.2
22631-81	Chromium	7.8	55.	62.5	61.0	99.5	96.7	2.4
22631-81	Lead	84.	55.	137.	136.	96.4	94.5	0.7
22631-81	Mercury	0.0	0.6	0.586	0.581	97.7	95.3	2.4
22631-81	Selenium	0.2	50.	47.0	48.5	93.6	96.6	-3.1
22631-81	Cobalt	11.	55.	64.7	63.2	97.6	94.9	2.3
22631-81	Copper	182.	55.	238.	240.	101.8	105.5	-0.8
22631-81	Nickel	12.	55.	65.3	63.7	96.9	94.0	2.5
22631-81	Zinc	693.	55.	745.	745.	94.5	94.5	0.0
22631-81	Silver	0.0	55.	58.5	55.9	106.4	101.6	4.5

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Report Date 6/1/95

6-Jun-95
Page: R-1
Job: 952182E
Status: Final

AMERICAN WEST ANALYTICAL LAB

Analyte: Gross Alpha
Fraction: Total
Method: 900.0
Units: pCi/g

Project:
Date Analyzed: 05/31-06/06
LLD: 2

Lab Id	Date Sampled	Matrix	Sample Id	Concentration~ 2^	LLD
952182-1	23-May-95	Soil	22631-93	6.9~5.8	2
952182-2	23-May-95	Soil	22631-95	10~6	2
952182-3	23-May-95	Soil	22631-96	6.8~6.1	2
952182-4	23-May-95	Soil	22631-97	7.2~6.1	2

Analyte: Gross Beta
Fraction: Total
Method: 900.0
Units: pCi/g

Project:
Date Analyzed: 05/31-06/06
LLD: 4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration~ 2^	LLD
952182-1	23-May-95	Soil	22631-93	12~5	4
952182-2	23-May-95	Soil	22631-95	18~6	4
952182-3	23-May-95	Soil	22631-96	9.8~5.3	4
952182-4	23-May-95	Soil	22631-97	15~6	4

AMERICAN
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ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 23, 1995
Lab Sample ID.: 22631
Field Sample ID: 22631-Method Blank

Contact: Daniel Horns
Date Received: May 25, 1995
Received By: Elona Hayward
Set Description: Ninety Seven Solid Samples

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Cobalt	6010	0.01	<0.01
Copper	6010	0.005	<0.005
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Nickel	6010	0.005	<0.005
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01
Zinc	6010	0.005	<0.005

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Report Date 6/7/95

APPLICATION FOR AUTHORIZATION TO USE

Surface Soil Assessment
Hecla Mining Company - Apex Unit
St. George, Utah

Dated: June 7, 1995

TO: Kleinfelder, Inc.
551 North 1400 East
St. George, UT 84770

FROM: (Please clearly identify name and address of person/entity applying for permission to use or copy this statement)

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